January 1980

radio communication

journal of the Radio Society of Great Britain

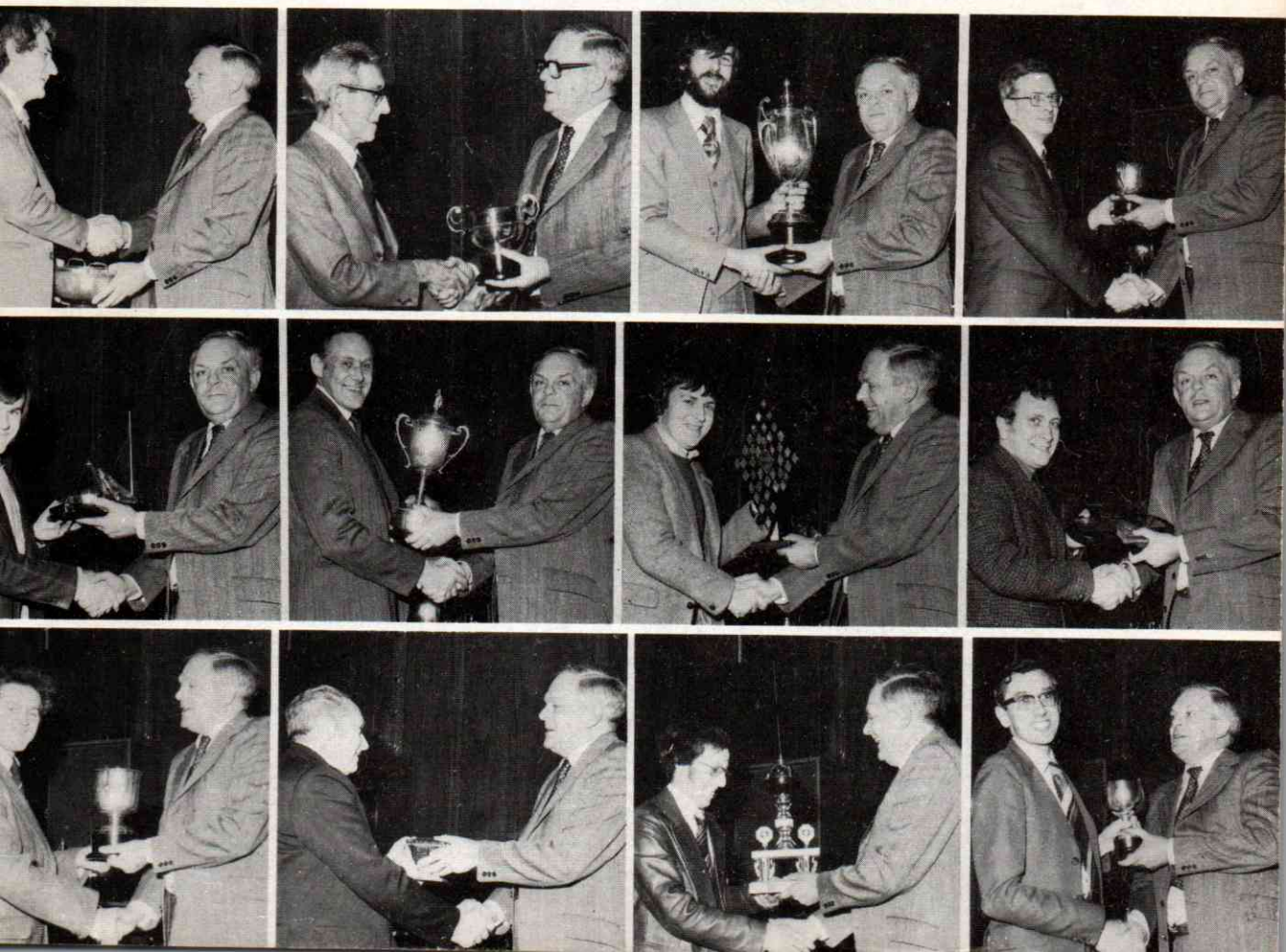
1979 AGM PRESENTATIONS

he Society's President, John Bazley, 3HCT, presenting awards at the 53rd AGM of the RSGB on 8 December 1979

Top, l to r: the Gravesend Trophy to D. J. Andrews, G3MXJ, on behalf of the Channel Contest Group; the Founders Trophy to C. H. Parsons, GW8NP; the Wortley Talbot Trophy to C. Suckling, G3WDG; the Courtenay Price Trophy to J. A. Hardcastle, G3JIR

Centre, l to r: the Houston-Fergus Trophy to J. C. Wayman, G4DRS, on behalf of the Shefford & D RS; the L. H. Thomas (G6QB) Trophy to P. A. Miles, G3KDB; the NFD Shield to M. H. Allisette, GU4EON, on behalf of the Guernsey ARS; the Edgware Trophy to M. E. Betts, G4FFW, on behalf of the Stockport RS

Bottom, l to r: the Raynet Trophy to D. E. Garrington, GM3RFA; the BERU Receiving Rose Bowl to R. W. Thomas, BRS15822; the Northumbria SSB FD Trophy to R. A. Ayres, GU4ASO, on behalf of the Guernsey ARS; the ROTAB Trophy to R. Balister, G3KMA



A STAR IS BORN
ANOTHER FIRST FROM Catronics

70cms SYNTHESIZED TRANSCEIVER

PHILIPS TYPE FM321

HAVE A HAPPY NEW YEAR ON 70cms WITH PHILIPS FM321

THE 70 cms REVOLUTION ★ ★ JOIN

THERE ARE NOW 74 × 70cms REPEATERS PLANNED OR OPERATIONAL

Catronics are proud to announce the availability of the world's first 70cms 40 channel FM mobile transceiver in the UK. Especially made to our own specification by Philips—Europe's largest manufacturer of Radiotelephone equipment.

Just look at its star packed features:

- ★ Full 40 channel coverage RBO to SU39
- ★ Direct LED display of channel number
- ★ Electronic Channel change up or down from front panel
- ★ Remote Control channel change on microphone
- ★ 3 position squelch control for ease of operation
- ★ "Nominated Repeater Position" may be preprogrammed to your local Repeater channel for instant access
- ★ Crystal controlled Toneburst operates in Repeater Mode
- ★ Receiver sensitivity 0.3μV for 12dB SINAD
- ★ Transmitter output power 5W minimum, gives typically 25W e.r.p. with Jaybeam U5 mobile antenna
- ★ Supplied complete with mobile mounting bracket, microphone with P.T.T. and channel change, operating manual etc

The Philips FM321—We want you to have the best—£215.22 + VAT = £247.50

ASK YOUR AMATEUR RADIO DEALER FOR A DEMONSTRATION

BUY FROM YOUR DEALER OR DIRECT FROM SOLE IMPORTERS:

CATRONICS LTD, DEPT PI, COMMUNICATIONS HOUSE,
20 WALLINGTON SQUARE, WALLINGTON, SURREY. Tel: 01-669 6700.

Shop/showroom open Monday–Friday: 9.00–5.30, closed for lunch: 12.45–1.45. Saturdays: 9.00–1.00.

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Access

BARCLAYCARD VISA

LOWE ELECTRONICS Ltd

THE ALL NEW TS 180S

Digital Frequency Control* . . . a TRIO innovation for maximum HF operating enjoyment!

Trio's TS-180S with DFC is an all solid-state HF transceiver designed for the DXer, the contest operator, and all other Amateurs who enjoy the 160 through 10-meter bands. The following features prove, beyond doubt, that the TS-180S is the finest rig available!

Digital Frequency Control (DFC), including four memories and manual scanning. Memories are usable in transmit and/or receive modes. Memory-shift paddle switches allow any of the memory frequencies to be tuned in 20-Hz steps up or down, slow or fast, with recall of the original stored frequency. It's almost like having four remote VFOs!

All solid-state . . . including the final. No dipping or loading. Just dial up the frequency, peak the drive, and operate!

High power . . . 200 W PEP/160 W DC input on 160-15 meters, and 160 W PEP/140 W DC on 10 meters. Also covers more than 50kHz above and below each band (28–30MHz,) WARC, etc.), and receives WWV on 10MHz.

Improved dynamic range.

Adaptable to all three proposed (WARC) bands.

Single-conversion system with highly advanced PLL circuit, using only one crystal with improved stability and spurious characteristics.

Built-in microprocessor-controlled large digital display. Shows actual VFO frequency and difference between VFO and "M1" memory frequency. Blinking decimal points indicate "out of band." Monoscale dial, too.

IF shift . . . Trio's famous passband tuning that reduces QRM.

Selectable wide and narrow CW bandwidth on receive (500-Hz CW filter is optional).

Automatic selection of upper and lower sideband (SSB NORM/SSB REV switch).

Tunable noise blanker (adjustable noise-sampling frequency).

RF AGC ("RGC"), which activates automatically to prevent overload from strong, local signals.

AGC (selectable fast/slow/off).

Dual RIT (VFO and memory/fix).
Three operating modes . . . SSB, CW, and FSK.

Improved RF speech processor.

Dual SSB filter (optional), with very steep shape factor to reduce out-of-passband noise on receive and to improve operation of RF speech processor on transmit.

13·8 VDC operation.

Also available is the TS-180S without DFC, which still shows VFO frequency and difference between VFO and "hold" frequencies on the digital display.

Full line of matching accessories, including PS-30 base-station power supply, SP-180 external speaker with selectable audio filters, VFO-180 remote VFO, AT-180 antenna tuner/SWR and power meter, DF-180 digital frequency control, YK-88 CW filter, and YK-88 second SSB filter.

Those operators who are fortunate enough to now own a TS180S are sending back reports that it's the best HF transceiver they have ever owned. We happen to agree with them but if you need more convincing, why not come to Matlock to try one out on the air—or send for full details right now.

With Trio's design capability and the Lowe Electronics back-up, how can you go wrong?

TS180S without DFC
—£712, including V.A.T.
TS180S with DFC
—£825, including V.A.T.
PS30 12V 20A supply
— £98, including V.A.T.

SEND 50p IN STAMPS FOR COMPLETE CATALOGUE AND ANTENNA BOOK
PLEASE SPECIFY ANY PARTICULAR INTEREST AND WE WILL SEND FULL INFORMATION

LOWE ELECTRONICS Ltd

TS-120—The system approach by TRIO

What do we mean by the "System Approach"? Well, take the TS120V at **£408,** including V.A.T. and you have the finest 20W PEP mobile HF transceiver you could buy. Consider the single conversion, PLL derived, top performance transceiver; the passband tuning; the digital readout; the noise blanker; the superb engineering; THEN maybe add the matching mains PSU for home use: PS20 **£52,** including V.A.T.: and you have an equally great fixed station; OR maybe add the extra VFO, or the external speaker and the 100 Watt ATU: SP120 **£25.50,** including V.A.T.; AT120 **£69,** including V.A.T.: OR maybe take a look at the new TS120S at **£495,** including V.A.T. **What's the TS120S?**

It's a compact, up to 200 watts PEP input, all solid-state HF transceiver with such standard features as built-in digital readout, IF shift, new PLL technology . . . and requires no tuning!

Exciting and perfect for car or ham shack use! But, there's more to say about the TS-120S! This unique all solid-state HF, SSB/CW transceiver produces a hefty signal and also offers a lot of other great features in a very attractive, compact package.

FEATURES:

All solid-state with wideband RF amplifier stages. No final dipping or loading, no transmit drive peaking, and no receive preselector tuning! *Just dial your frequency and operate!*

Five bands, plus WWV. Transmits and receives on 80/75, 40, 20, 15, and all of 10 meters . . . and receives WWV on 15MHz.

200 watts PEP (160 watts DC) input on 80-15 meters, 160 watts PEP (140 watts DC) input on 10 meters. LSB, USB, and CW.

Digital frequency display (standard). 100-Hz resolution. Six digits. Special green fluorescent tubes eliminate viewing fatigue. Analog subdial, too, for backup display.

IF shift (passband tuning), to remove adjacent-frequency interference and sideband splatter.

Advanced PLL circuit, which eliminates need for heterodyne crystal element for each band. PLL lock frequency, CAL marker signal, and counter clock circuit use single reference frequency crystal. Simplifies circuitry, improves overall stability. Also improves transmit and receive spurious characteristics.

Attractive, compact design. Measures only $3\frac{1}{2}$" high × $9\frac{1}{4}$" wide × $13\frac{1}{2}$" long, and weighs only 4·9 kg (11·7 lbs.) A perfect size for convenient mobile operation and rugged enough for either mobile or portable use. Also has all the desired features for optimum ham-shack operation at home.

Noise blanker. You'll wonder where the ignition noise went.

See the big little TS-120S rig and matching accessories (VFO-120 remote VFO, SP-120 external speaker, PS-30 AC power supply, MB-100 mobile mounting bracket, AT-120 antenna tuner and YK-88C CW Filter) at the centre for all that's good in Amateur Radio—LOWE ELECTRONICS in MATLOCK. Or—send for full details right now.

TL120 200W PEP linear now in stock **£158** inc VAT.

TRIO + LOWE = SATISFACTION

LOWE ELECTRONICS Ltd

NEW! R 1000

Stand by to receive the World!

It's goodbye Wadley loops and hello to the new, true up-conversion, PLL system HF general coverage receiver from Trio.

The new R-1000 is going to turn the general coverage receiver world upside down since it combines professional performance with a really attractive price, thanks to Trio's commitment to using advanced technology to simplify operation rather than make complex gimmickry.

The R-1000 uses an advanced PLL system in an up-conversion scheme to a high (48MHz) first IF to remove any possibility of image responses. The receiver covers the entire frequency range from below 200kHz right up to 30MHz in 30 bands, each 1MHz wide. The bands are selected, not by ambiguous knob twiddling as in receivers using the Wadley loop but by a 30 position band switch which controls the PLL system.

The band switch also electronically selects the appropriate band pass filter network in the RF stages of the receiver so there are no "preselector" or "antenna trim" controls to twiddle – simply set the band switch to the range required – that's it!

A highly stable VFO tunes each 1MHz range and its linear, back lit scale makes readout easy. However, in addition to this dial, Trio have also provided 5 digit true frequency digital readout so as to guarantee spot on accuracy on any frequency. As a further feature, the digital display can also be switched to read time, this being derived from a quartz standard. Marvellous for accurate log keeping. The display uses high intensity readout units which can be dimmed for use in low light conditions.

As for what else is inside this superb instrument – selectivity is catered for by three custom made IF filters; a 12kHz wide AM filter; 6kHz narrow AM filter; and a new 2·7kHz SSB filter with a shape factor of better than 1:2 6:60dB. Selectable sidebands are available at the touch of a switch.

For the first time in a mid price receiver, a true noise blanker is provided to remove pulse type ignition noise.

To minimise front end overload, a step RF attenuator is included which gives 0–60dB attenuation in four steps.

All the rear panel connectors are recessed on a sloping panel so that you can stand the receiver either on its back, or pushed hard against a wall when used in conventional shelf mounting. The antenna inputs allow the use of either a high impedance wire aerial or a 50ohm balanced input so that the proverbial long lump of wire will work really well with the R-1000.

Almost forgot – the R-1000 will work from either 12V dc or any mains supply from 100–240V 50/60Hz so you can really take it anywhere with you.

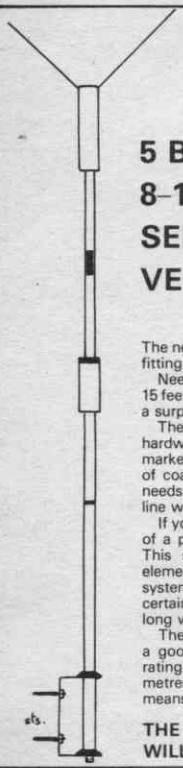
We're not too convinced about the carrying handle but the people we asked were divided almost 50:50 on this aspect so – leave it on. After all, the design allows it to be folded away out of sight!

How big? 300mm wide × 115mm high × 218mm deep
How heavy? 5·5Kg (about 12lb)
How much? **£298** inc VAT.
How soon? Get thi' name down now. Demand will outstrip supply.

The basic features of the R-1000 do not tell the full story, because you cannot explain the superb "feel" of the receiver until you can handle it in the flesh. So, the advice is to see it soon at Lowe Electronics in Matlock.

ASK ABOUT OUR NEW CREDIT CARD – DETAILS ON OPPOSITE PAGE

LOWE ELECTRONICS Ltd



HF5

5 BANDS
8–10 METRES
SELF-SUPPORTING
VERTICAL

The new HF5 vertical aerial is a real answer to the problem of fitting a five-band aerial in a small space.

Needing only a metal ground post, and being only around 15 feet high, the Lowe HF5 gives you real DX performance at a surprisingly low cost.

The HF5 is made from strong alloy tubing with stainless hardware and unlike some other verticals currently on the market, gives a 50 ohm match at the base so that any length of coaxial feeder may be used. Beware the vertical which needs a critical feeder length, it's simply a disguise for a feed line with a high SWR.

If you need to mount the HF5 up at roof level or on the top of a pole, a matching five-band radial system is available. This system comprises a loading coil and alloy radial elements so as to reduce the space taken up by the aerial system. The cost of this radial kit is lower than the HF5 and certainly a lot more convenient than trying to stretch out long wire radials across the roof.

The HF5 system gives you coverage from 80 to 10 metres, a good 50 ohm feed impedance and a reasonable power rating of 200W on 80 and 40, rising to 500W on 20, 15 and 10 metres. Weight of the assembled aerial is around 3kg (which means that you can lift it with ease).

THE HF5, A WINNER ALL ROUND (IF YOU WILL EXCUSE THE PUN) £41.40 inc VAT

THE WAY TO HAVE TOMORROW'S EQUIPMENT TODAY

Everyone is talking about the new Lowe credit card scheme, following its introduction at Leicester. This is the new, easy way to have the rig you wanted right away and avoid any future price rises. How does it work? You simply agree to pay a fixed amount each month and you then get instant purchasing power of 24 times the payment. For example, a payment of £20 gives you £480 of credit, more than enough to buy that TSI20V, aerial and accessories. No fuss and no hefty deposits needed. A further advantage is that as the payments continue, your credit is automatically extended to allow further purchases. Why not send for full details right away and join the growing numbers who hold the Lowe blue card—the way to have tomorrow's equipment today. A major advance to your purchasing power.

CN-620 SWR & POWER METER

ALSO AVAILABLE, THE **NEW CN630** WHICH HANDLES 2m AND 70cm MEASUREMENTS **£71.00** inc VAT.

CN-620 SWR & POWER METER

The CN-620 is a radical departure from the accepted norm for in-line power and SWR measurements and represents a considerable improvement over all existing power meters.

The system is based on a crossed needle twin meter, one needle indicating forward power, the other reflected power. The point at which the two needles cross indicates the SWR existing on the system. In one instrument, you combine power and SWR measurement with high accuracy and simplicity of operation.

The CN-620 is simply inserted into any 50 ohm coaxial line. No adjustments are necessary in order to use the instrument. The CN-620 covers the frequency range from 1·8 150MHz and can measure power as low as 400mW reflected and as high as 1kW forward using three easy to read ranges. With the CN-620, doubt in measurement is a thing of the past and once you have used the CN-620, all other power meters will seem old fashioned.

£52.81 inc VAT

CN-620 SPECIFICATION

Frequency range	1·8 150MHz
Line impedance	50 ohms
Power ranges forward	20W, 200W, 1kW
Power ranges reflected	4W, 40W, 200W
Through power rating	1kW CW, 2kW P.E.P. 1·8 30MHz 250W CW, 500W P.E.P. 140 150MHz
Min. power for SWR measurement	5W
Connectors	SO239
Size	165 × 75 × 97mm

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HOW ABOUT GETTING 70cm FM GOING! TRIO TR3200 NOW ONLY £140 inc VAT

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CHESTERFIELD ROAD, MATLOCK, DERBYS. TEL: 0629-2817 or 2430. TELEX 377482. OPEN 9-5.30 TUES-SAT. PHONE IN 9am-9pm.

For personal attention on the South Coast contact John, G3JYG, 16 Harvard Road, Ringmer, Lewes, Sussex. Ringmer 812071.

For equally helpful attention in Scotland contact Sim, GM3SAN, 19 Ellismuir Road, Baillieston, Nr. Glasgow. 041-771 0364.

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ICOM®

Tried — Tested and Popular . . .

THE LEADER BASE STATION

IC-211E

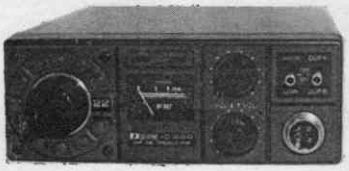
Fast becoming one of the most popular base station rigs because of its superb performance and advanced technology, the IC-211E leads the field in 2M base stations. With a full synthesizer which employs state of the art technology it provides all you want for full coverage on FM USB, LSB or CW on 2 metres with that extra bit of quality for which ICOM are so renowned, plus the chance to use the latest digital technology and even drive it from your home computer if you wish!
Less VAT = £477.39 With VAT = £549

THE MOBILES

IC-255E 25 WATT FM!

- ★ 25 watt output (1 watt low power).
- ★ 5 memories. ★ 2 VFOs.
- ★ Built-in scanner (with optional mic for scan control from the mic). Can scan the whole band, a selected portion, or just the memories.
- ★ Normal and reverse repeat—600kHz shift built-in plus another user programmable shift, from the front panel (for 70cm transverting?).
- ★ Size 64 × 185 × 223mm.

PRICE £255 INC VAT



IC-240
NOW £193 inc.

The IC-240 is the ideal mobile rig for most people. Apart from the fact that it is quite a lot cheaper than most, it is, in fact, more suitable than many to use in the car while driving (and let's face it, it is under those conditions that most mobiles are used). It can be operated with ease without taking your eyes off the road and provides up to 22 channels (which is more than you are likely to need). Being synthesized, of course, there are no crystals to buy for extra channels. Full repeat, reverse repeat and automatic tone burst plus a low power facility are selectable from the front panel. By adding a 'Superscan' at a later date you can obtain full scanning facilities over the whole band at a VERY competitive price.

The IC-240 is a superbly built and very reliable piece of equipment as witnessed by the many thousands in use. All Icom equipment is built to a very high standard and the IC-240 is no exception. It has an excellently sensitive receiver and a very clean transmitter and will give you hours of headache-free pleasurable use—so why not get one now before the price goes up again!
240 Alone Less VAT = £167.91 With VAT = £193.00

IC-280E
NOW £250 inc.

★ WITH SCANNER £260

As usual, ICOM have kept ahead with technology and have produced their revolutionary new IC-280E which uses a microprocessor to produce frequencies throughout the 2m band at the ideal 25kHz spacing required today. The IC-280 has the ideal advantage of being separable into two parts for easy mounting into today's cars which so often forget to leave space for a rig. The removable front panel, with all controls, is only 3" deep and will fit in any convenient spot—in the glove pocket, on the dash or even on the sun visor! The main part of the set can be mounted anywhere within 4 feet—or even further in many cases—under the passenger's seat is quite handy! Display is of frequency on an LED readout and there are three memories for your favourite channels. These are not cleared when the set is switched off as long as it is left connected to the car battery.
Less VAT = £217.39 With VAT = £250

AGENTS (PHONE FIRST—All evenings and weekends only, except Barnsley and Burnley)
Scotland—Jack GM8GEC (031-665 2420)
Wales—Tony GW3FKO (0222 702982) **Burnley**—(0282 38481) **Midlands**—Tony G8AVH (021-329 2305)
North West—Gordon G3LEQ (Knutsford (0565) 4040) **Yorkshire**—Peter G3TPX (022678 2517 Evenings) (0226 5031 Day)

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143 Reculver Road, Beltinge, Herne Bay, Kent (02273 63859)

Access

ICOM®

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G4ELP

. . . Simply the Best . . .

IC-215
£162 inc.

The IC-215 is getting more and more popular also as it combines the advantages of a portable, which can be operated anywhere, with the ability to double as a low power base station by virtue of its 3 Watts of output and SO239 antenna connecter on the back. Of course there are facilities to operate it from an external power supply, and if it is fitted with Ni-Cads you can arrange to trickle charge these at the same time. The batteries used are of a sensible size being C type (or UII) instead of the 'penlight' batteries used by most of its competitors. This gives at least three times the operating power when you are away from home which you will appreciate if ever you have run out of battery in the middle of a QSO! It comes already crystalled up for 12 channels, S20, S22 and all the repeater channels 0 to 9. We think the extra power and larger batteries far outweigh the advantages of having the extra channels produced from a synthesizer.
Less VAT = £140.87 With VAT = £162.00

IC-202S
£199 inc.

ICOM's range of sideband portables has been recently expanded. The well known and tested IC-202E has now been improved in the form of the IC-202S which has lower side band fitted also and provides sidetone on CW. The receiver has been hotted up making it even more suitable for use as a base station, either barefoot or as a prime mover. The new IC-402 is the 70cm version of the 202S giving the same facilities as its 2m cousin over the range 432-435·2 MHz. Both use a very stable VXO circuit, to give fully tuneable coverage of the band in 200kHz segments and both have extremely clean signals so that using them to drive a linear to the full legal limit presents no problems. We are very impressed with both the 202S and the 402.
The IC-202E was good . . . these are even better!

IC-202S	Less VAT = £173.04	With VAT = £199.00
IC-402	Less VAT = £255.65	With VAT = £294.00

IC-402

NEW!

IC-260E
£369 inc.

IC-260E MULTIMODE MOBILE

This exciting new mobile offers you FM, USB, LSB and CW all in a neat small package. All with a built-in scanner too! Will scan 3 memory channels or scan between two programmed frequencies stopping on a received signal IN ALL MODES.
Other features include: Noise blanker, CW break-in, CW monitor, automatic PA protection, micro computer control, two independent VFOs, tuning steps of 1kHz and 100Hz in SSB and CW or 5kHz and 1kHz in FM, full frequency readout in bright LED. Fast/slow AGC. Don't hesitate to ask for more details.

Phone — or put a message on the ansafone for further details*

ALSO AVAILABLE FROM OUR SHOP IN HERNE BAY

MICROWAVE MODULES **WESTERN** **ANTENNA SPECIALISTS** **STANDARD**
J-BEAM **G WHIP** **YAESU MUSEN** **RSGB PUBLICATIONS** **BEARCAT**

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PAUL
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ICOM®

IT'S HERE!!

THE MOBILE OF CHOICE FROM THE WORLD FAMOUS

ICOM STABLE — THE IC-255E

25 Watts—5 Memories—Scanning—600kHz AND User Selectable Repeater Shift—Full Coverage in 5kHz or 25kHz Steps

We have had a poke around one of these little beauties and are certain that ICOM, yet again, have come up with a winner. As you can see it has the expected smart ICOM appearance. Features include:-

- ★ Crystal controlled Tone Burst
- ★ Full band coverage—extendable to 148MHz if required
- ★ Four digit LED display
- ★ 25 Watts output or 1W low power
- ★ A superb receiver using grounded gate FET front end
- ★ Scanning over a user programmable range
- ★ Memory scan
- ★ Stop on empty or busy channels
- ★ Tuning in 25kHz or 5kHz steps
- ★ 5 Memories—retained while the power is connected to the rig
- ★ Built-in 600kHz Repeater Shift
- ★ Alternative programmable shift
- ★ Reverse Repeater facilities
- ★ RIT (±3kHz) for those off channel stations
- ★ Scan control from the microphone (an optional mic available shortly)
- ★ Good loud audio
- ★ Optically coupled tuning between control knob and CPU
- ★ Multiway 24 pin socket on back for touchpad, computer, or external control (note the current RM3 cannot be used but a new version is to be introduced)
- ★ Rugged modular PA (Guaranteed of course!)
- ★ Mobile mount which can be padlocked

At £255 including VAT these are such value for money that demand may exceed supply for a while—but they are worth waiting for! (Delivery is free of course by Registered First Class Letter Post.)

FROM **THANET** OF COURSE

ICOM®

DAVE
G4ELP

DON'T WORRY—WE GUARANTEE ALL SOLID-STATE RIGS INCLUDING PA's

1. IC-211E 2m All-mode

Covering the full 2 metre band with fully synthesised multi-mode operations, the IC211E is the most advanced, highest quality 2 metre transceiver available anywhere. The IC211E comes complete with ICOM's single-knob frequency selection and two digital VFO functions, standard features at no extra cost.

The large weighted flywheel knob mounted with low friction ball bearings is used to drive an optical chopper to provide pulses to the synthesisers LSI, which shows a full 7 digit readout. A breaking mechanism, which operates electrically, engages to provide a smooth feel at slow speeds; and a "dial lock" button holds the reading at the time it is pushed, even though the knob continues to rotate.

The IC211 incorporates computer compatible interface via the 24 pin accessory socket on the rear panel which enables PIA connection for the microprocessor buff.

The IC211's synthesiser steps are displayed, with positively no time lag, backlash or uncertainty in display stability, in increments of 100Hz or 5kHz from 144–146MHz. Any offset for repeater use can be programmed.

SMALL ENOUGH FOR MOBILE!

The IC211 contains both 240vac and the 13.6vdc power supplies and has a built-in high SWR autopower control. Variable output power contributes to the IC211's versatility. Output between 500 milliwatts and 10 watts may be front panel controlled on FM.

More of the maximiser's built-in standard features include: a pulse type IF noise blanker; front panel discriminator meter, SWR meter; VOX with adjustable VOX gain delay and antivox; CW monitor volume level; and semibreak-in CW operation.

And your new IC211 carries the THANET 1 year warranty backed by spare parts and technical expertise if bought directly from us.

COMPARE THE IC211 WITH THE OTHERS! £549 inc. VAT

2. Computer compatible

IC-701 HF £899

ICOM's superior LSI technology takes the lead in Amateur HF. The extremely compact **IC-701** delivers 100 watts output from a completely solid state, no tune (broad band design) final, on all modes and all bands, from 160–10 M. With single knob frequency selection and *built-in dual VFO's,* the LSI controlled **IC-701** is the choice in computer compatible, multi-mode Amateur HF transceivers.

The **IC-701's** single frequency control knob puts fully synthesised instant tuning at a single finger tip. **WIDE** bandspread, with 100Hz per division and 5kHz per turn, is instantly co-ordinated between the smooth turning knob and the synthesiser's digital read-out with positively no time lag or backlash (no waiting for counter to update: less operator fatigue). And at the push of the electronic high speed tuning button, the synthesiser flies through megacycles at 10kHz per step (500kHz per turn).

The computer compatible **IC-701** LSI chip provides input of incremental step or digit-by-digit programming data from an external source, such as the microprocessor controlled accessory which will also provide remote band selection and other functions.

Full band coverage of all six HF bands, and continuously variable bandwidth on filter widths for SSB, RTTY, and even SSTV, help to make the **IC-701** the very best HF transceiver ever made. **IC-701** includes two CW widths, all of this standard at no extra cost.

Sold complete with the high quality electret condenser base mic (SM-2), the **IC-701** is loaded with many ICOM quality standard features. Standard in every **IC-701** are *two independently selectable, digitally synthesised VFO's at no extra cost.* Also standard are a double-balanced schottky diode 1st mixer for excellent receiver IMD, and RF speech processor, separate drop times for voice and CW VOX, optionally continuous RIT, fast/slow AGC, efficient IF noise blanker, fast break-in CW, and full metering capability.

FROM THANET OF COURSE

WATERS & STANTON ELECTRONICS

Factory Prices REDUCED!

FDK MULTI-700E

£195 inc VAT

HOLD IT!

FDK 2m & 70cms

HAND-HELDS
1 WATT, 6 ch

PALM II (144MHz) **£99**
PALM IV (432MHz) **£159**

Prices include ni-cads, AC chargers, Xtal tone-burst and carrying strap. Leather cases **£5.75.** S20/SU20 fitted. Extra channels **£3.00**

SAE FOR LEAFLETS

TUNES IN 25kHz and 12½kHz CHANNELS. 1-25 WATTS OUTPUT VARIABLE. INSTANT REVERSE REPEATER OPERATION. INCLUDES MICROPHONE, MOBILE MOUNTING BRACKET AND DC LEADS.

HURRY WHILST STOCKS LAST.

STOP PRESS!

Mobile safety mics back in stock complete with boom and gear lever switching boxes. State transceiver model when ordering. **£20.95** inc. VAT.

WATERS & STANTON ELECTRONICS

TRIO

APPROVED TRIO DEALER

ALL PRICES INCLUDE 15% VAT

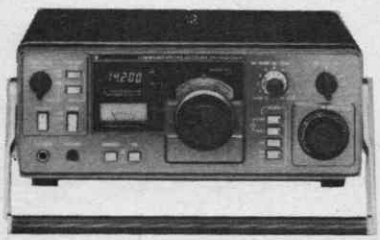
TRIO TS120V £408
TS120S £495

SOLID STATE RIG RELIABLE AT LAST

Up until now there has been a natural reluctance to accept solid state HF rigs as anything but a second rig or mobile unit with dubious reliability of the PA devices. Now at last the new TS120 series gives you 80-10 metre coverage at either 10 watts output or 100 watts output. Digital readout and variable selectivity are just two features that put them in a class above any other solid state rig we know of (apart from the TS180S) – even those costing nearly £1,000. The TS120 will put to shame many of the older valve PA designs and can confidently be regarded as a good reliable base or mobile station – and no tune-up means instant QSY from band to band at the flick of a switch.

TRIO TS520SE £485 inc VAT **NEW LOW PRICE UNBEATABLE**

For the operator that wants an HF transceiver on a budget this surely must be the answer. 160-10 metres (full coverage) with built-in speech processor and the fine Trio engineering that now has become a legend amongst amateurs around the World. The price is really competitive and from tests we have carried out we must say that if you are looking for a 100 watts output base station the TS520SE should be top of your list for value for money. A pair of fan cooled 6146B's ensures high efficiency and good linearity. There's no longer a 12 volt facility but for mobile work it's a little big these days – for base station use it's unbeatable at this price.

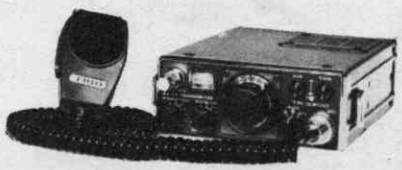


NEW **TRIO R1000 £298 inc VAT**

At last the Trio R1000 has been announced – a real purpose-built receiver for the serious short wave listener. 200kHz to 30MHz in 30 bands. This receiver has many features that are not available on other models and, of course, has the technical backing of the world's largest manufacturers of amateur communications equipment. Features include: 1kHz digital readout and separate analogue dial, large high quality speaker, digital 12 hour clock – AM and PM, three separate filters for razor sharp selectivity, noise blanker (try finding this on any other receiver!), automatic preselector tuning via the 1MHz band switch, three-stage attenuator, dimmer control, tone control, timer circuit, and all this in a diminutive package measuring $12\frac{3}{4} \times 4\frac{1}{2} \times 8\frac{7}{8}$ in. Trio have now solved the problem of choosing a receiver – there is no choice – it's got to be Trio!

KING OF THE PORTABLES

TRIO TR2300 £199



The TR2300 is a remarkable package which combines all the advantages of a portable station with those of a mobile transceiver. In many ways it's the ideal "starter rig" in amateur radio. Full band coverage from 144-146MHz in 80 × 25kHz channels plus 600kHz repeater shift and 1750Hz automatic tone-burst complete its versatility.
The dial is directly calibrated in frequency and has illumination for night use. The transmitter is exceptionally clean with an output power in excess of 1 watt. Receiver sensitivity is every bit as good as the best mobile rigs and either internal batteries or an external DC source may be used. Fits easily into a suitcase or on the corner of a desk and makes a really compact mobile rig. Price includes carrying case, shoulder strap, battery charger, external DC cord and, of course, the Waters & Stanton 12 month warranty. An absolute bargain – we even sell them to our staff!

NEW

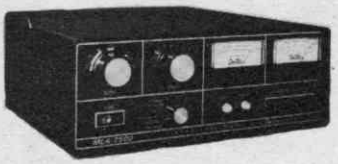
TRIO

TR2400 £235

The new TR2400 really does eclipse all other hand-helds in its sheer technology. There's no other model that can approach its performance. The large LCD readout has low current drain and the 1·5 watts output is a good compromise between effective communication and reasonable battery drain. 10 memories, automatic scanning, instant reverse repeater operation, 16 key touch-tone encoder, 144-148MHz etc etc . . . all adds up to the new leader in hand-helds . . . the Trio TR2400. Get your Barclaycard or Access cards ready for this one . . . half its fascination is operating it – the other half is owning it.

Waters & Stanton

TWO SUPER POWER HOUSES . . . IMPORTED DIRECT BY US



IN STOCK NOW!
DenTron
MLA 2500
160–10m 2kW PEP
£695 inc. VAT
and delivery

Send 25p for complete DenTron HF Catalogue

- 1kW DC continuous
- ALC circuit
- 3 speed cooling
- Military specifications
- 234v/117v AC
- 2 of EIMAC 8875 tubes
- R.F. Wattmeter (incl. p&p)
- Size 5½" × 14" × 14"
- Weight 47lb.
- Ideal for SSTV/RTTY
- 3rd order down 30dB +
- 40 watts drive for 1kW

160–10m ATU's also in stock

144 MHz!
NAGAI
2200 LINEAR
£429
inc. VAT
(Securicor £4.50)

Sae for colour brochure

- 240v AC
- 4CX-350F tube
- Receiver pre-amp
- 10–13 watts drive
- SWR meter built-in
- 500W PEP input
- 400W FM/CW input
- Fan cooled
- 12v DC output—3 amps
- Covers 144–146MHz

FDK **PALMSIZER**

40 × 25kHz Channels 145–146MHz
BULK SHIPMENT AT SUPER PRICE!
£149 inc. VAT buys this.....

- ★ Cigar lighter plug
- ★ External DC cord
- ★ Over one watt output
- ★ AC charger included
- ★ 40 channel capability
- ★ Simplex or ±600kHz switch
- ★ BNC aerial socket
- ★ Flexible whip supplied
- ★ Xtal controlled tone-burst
- ★ Ni-cad battery pack supplied

OR PALM II & IV

The Palm II and IV offer truly amazing value for money in the field of hand-held transceivers. Certainly they are the most compact units currently available and fit easily into the pocket. The built-in condenser microphones make for a really superior quality of audio that would do credit to many base stations. Accessories such as ni-cads, AC chargers and helical whips are all included in the basic price and additional channels will cost you a mere £3. Repeater operation is fully catered for with the built-in crystal controlled tone-burst and both the 2 metre and 70cms models have plus and minus repeater shifts. Don't miss these amazing prices—just think, you can have both 2 metre and 70cms hand-helds for less than £260 inc. VAT—can't be bad!

NEW! BEARCAT 220 VHF/UHF MONITOR

66·88MHz; 118–136MHz; 144–174MHz; 420–112MHz

If you're interested in 4 metres, 2 metres, or 70cms, Aircraft, Marine, Police, Ambulance, fire, high or low band mobiles, this is the monitor for you. 240v AC or 12 volts DC (mobile mount supplied) plus portable telescopic whip. AM/FM, channel scanning, search, fully programmable and not a crystal to buy. **£241** inc VAT.

R517
AIR BAND MONITOR
VFO + 3 fixed channels £49.50

Not a toy but a real professional monitor of extremely high sensitivity. Powered either by 6 HP7 batteries or an external 9 volt source, this receiver tunes 118–144MHz. In addition to the main tuning control there is a fine tuning wheel for spot-on reception. For prolonged or priority monitoring up to 3 crystal controlled channels can be selected (crystals £2.50 each). If your interest is in aircraft we can really recommend this unit—and it's not in a plastic case—it's built into a really robust metal case. Forget those units costing twice as much, this one really does it all!

FDK

TM 56B
VHF MONITOR

The TM56 is one of our most popular models, combining great performance with modest price. The TM56B has the basic receiver design of our mobiles and includes its own 230 volt AC supply, plus external 12v DC input. 12 fixed channel positions are included, plus 4 autoscan positions. Any one of the Autoscan channels can be cancelled. Price includes 10 channels, R3, R4, R5, R6, R7, S0, S20, S21, S22 and S23, necessary leads, etc, and 12 month guarantee. At **£106** it is unbeatable! 10 channel marine version **£115** inc. VAT.

HUGE DISCOUNT! 2B2M
2m SSB/CW PORTABLE

Fitted 144·2–144·6MHz £135

WATERS & STANTON ELECTRONICS

SALES & SERVICE

We try to keep a very wide selection of all that's good in amateur radio. Occasionally new products are added and others deleted—usually when they become obsolete or technically unsatisfactory. As radio amateurs ourselves we're a pretty fussy bunch so you can buy with confidence from us. Our policy has always been to despatch goods the same day if possible. Our recent move of premises has caused a few delays but we are now back to normal and our new mail order warehouse is simply bulging with goods ready to be despatched anywhere in the UK. New stock control methods and full-time packing staff means a better deal for you the customer. And remember, as one of the largest amateur retailers in the UK, we have a reputation and after-sales back-up service second to none. Simply send us your cheque or quote your Barclaycard or Access number for immediate despatch.

TRIO

TS820S 160–10m transceiver 200w digital	£832.00 (3.75)
TS820 160–10m less digital	£710.00 (3.75)
SP820 External speaker	£39.00 (1.50)
TS520SE 160–10m transceiver 200w	£485.00 (3.75)
SP520 External speaker	£18.00 (1.25)
VFO520S External VFO	£103.00 (3.75)
TS120S 80–10m Solid state 200w	£495.00 (3.75)
TS120V 80–10m Solid state 10w	£408.00 (3.75)
PS20 AC PSU (TS120V)	£52.00 (3.75)
PS30 AC PSU (TS 120S & TS 180S	£98.00 (3.75)
MB100 Mobile mount	£17.00 (0.75)
AT200 1·8–30MHz ATU	£95.00 (1.50)
MC50 Desk microphone (Super!)	£27.50 (1.50)
MC30S Noise cancelling hand mic.	£13.30 (0.50)
TS770 2m/70cm all mode transceiver	t.b.a
TR7625 2m FM mobile 25w 80ch.	£273.00 (3.75)
TR2300 2m FM portable 80ch.	£199.00 (3.75)
MB2 Mobile mount (2300)	£18.90 (1.00)
TS180s 160–10m solid state transceiver	£825.00 (3.75)
TR3200 70cm portable 3 ch. fitted	£140.00 (3.75)

YAESU

FRG-7 General coverage receiver	£214.00 (N/C)
FRG-7000 Digital readout receiver	£375.00 (N/C)
FT101Z Transceiver	£575.00 (N/C)
FT101ZD Transceiver	£661.00 (N/C)

ICOM (special prices on some models)

IC215E 2mFM 3 watt 12 chs	£162.50 (N/C)
IC202S 2m SSB 3 watt portable	£199.00 (N/C)
IC240 2m 22 ch's 10 watts	£193.00 (N/C)
IC280E 2m FM 80 ch's 10 watts	£250.00 (N/C)
IC211E 2m All mode transceiver	£549.00 (N/C)

MICROWAVE MODULES (NEW PRICES)

MMT 432/28-S transverter	£136.75 (N/C)
MMT 432/144-R transverter	£173.50 (N/C)
MMT 144/28 transverter	£90.75 (N/C)
MMC 144/28–30 converter	£21.85 (N/C)
MMC 144/28 LO converter	£24.15 (N/C)
MMC 70/28 converter	£21.85 (N/C)
MMC 70/28 LO converter	£24.15 (N/C)
MMC 432/28 S converter	£29.90 (N/C)
MMC 432/144 S converter	£29.90 (N/C)
MMC 1296/144 or 28 converter	£32.00 (N/C)
MMC 28/144 10m up converter	£20.70 (N/C)
MMD 050/500mHz counter	£69.00 (N/C)
MMA 144 2m pre-amp	£14.90 (N/C)
MMD 500P 500mHz pre-scaler	£23.00 (N/C)
MMV 1296 varactor tripler	£34.50 (N/C)
MML 144/100w linear amplifier	£142.50 (N/C)
MML 432/100w linear amplifier	£228.00 (N/C)
MML 144/25w	£48.30 (N/C)
MML 432/50w	£113.75 (N/C)

SEM

2m converters	£23.00 (N/C)
70cms converters 144 IF	£23.00 (N/C)
2m pre-amp	£14.95 (N/C)
2m auto switching pre-amp	£19.50 (N/C)
70 cms auto switching pre-amp	£22.63 (N/C)
2m PA3 pre-amp	£8.00 (N/C)
70cm PA3 pre-amp	£10.00 (N/C)
2m 48 watt linear/pre-amp	£66.70 (0.95)
All pre-amps fitted SO239 sockets	

HF auto pre-amp 2-40mHz	£16.68 (N/C)
HF pre-amp 2-40mHz	£11.73 (N/C)
HF Z-MATCH ATU 80-10m	£45.00 (1.00)

VHF MONITOR Rx's

TM56B 12v/240 AC auto scan 10 ch's	£106.00 (N/C)
TM56B Marine model	£115.00 (N/C)
SR9 12v DC Marine model	£48.00 (N/C)
Extra xtals	£2.45 (N/C)

FDK (New PII price!)

Multi 3000 2m All mode	£495.00 (N/C)
Multi 800D 2m 25 watts	£289.00 (N/C)
Multi 700E 2m 25 watts	£229.00 (N/C)
Multi Palm II 2m hand-held special package	£99.95 (N/C)
M-11/Q16 xtals £5.00 Palm II xtals £3.00	
Multi-Palmsizer 2m synthesised 40 channel hand-held	£149.00 (N/C)
Palm IV 70cms	£159.00 (N/C)

DENTRON

MLA 2500 160-10m 2Kw linear	£699.00 (N/C)
MT3000A 3Kw 160-10m tuner	£280.00 (N/C)
MT2000A 3Kw 160-10m tuner	£180.00 (N/C)
160-10AT Supertuner 1Kw	£99.95 (N/C)
JR Monitor 160-10m tuner 300w	£59.95 (N/C)
W-2 160-10m PEP/SWR meter	£59.95 (N/C)
MT 200A Transceiver	£399.00 (N/C)
1Kw 80-10m linear 240v GLA 1000	£295.00 (N/C)

AR

AR240 Synthesised hand-portable	£168.00 (N/C)

MIZUHO (NEW LOW PRICE!)

2m SSB 1 watt portable	£135.00 (N/C)
Extra xtals	£3.00

NAIGAI (NEW LOW PRICE!)

2200 2m 500w PIP linear	£429.00 (N/C)

ADONIS MICROPHONES

AM802G Compressor - 3 outputs	£59.95 (N/C)
AM502G Compressor - 1 output	£39.95 (N/C)

ASP MOBILE ANTENNAS

201 - 2m ¼ wave	£3.50 (1.00)
2009 - 2m 5/8th wave	£9.25 (1.00)
677 - 2m 5/8th wave deluxe	£14.95 (1.00)
462-70cms colinear	£8.25 (1.00)
667 - 70cms colinear deluxe	£17.95 (1.00)
Magnetic base and cable	£8.50 (1.00)
"No-hole" boot mounts	£3.75 (0.50)

HF ANTENNAS

HQ-1 20-15-10m mini-quad	£96.50 (2.50)
C4 20-15-10m vertical	£48.50 (2.00)
Mosley 20-15-10m mini-beam 600w	£99.00 (2.00)
Mosley 2Kw version	£129.00 (2.00)
TA32 600 watts 20-15-10m	£81.00 (2.00)
TA33 600 watts 20-15-10m	£120.75 (2.50)

All prices include VAT at 15%
Coming soon! 16 and 20 amp power supplier £69 and £95. Phone for details

Mustang 2Kw 20-15-10m	£149.50 (2.50)
Hy-gain 12 AVQ 20-15-10m	£43.00 (2.00)
Hy-gain 14 AVQ 40-10m	£60.00 (2.00)
Hy-gain 18 AVT/WB 80-10m	£87.00 (2.25)
Mosley TD3JR 20-15-10m dipole	£31.00 (1.00)
Mosley RD5 SWL ham dipole	£36.30 (1.00)
EL-40X 80-40 Mini dipole	£39.50 (1.00)
HF5 5 band vertical	£41.50 (1.00)

VHF ANTENNAS (JAYBEAM)

4Y/4M 4el yagi	£17.20 (2.00)
C5/2M 5db colinear	£40.00 (2.00)
5Y/2M 5el yagi	£10.25 (1.50)
8Y/2M 8el yagi	£13.25 (1.50)
10Y/2M 10el yagi	£28.40 (2.00)
PBM10/2M 10el parabeam	£33.60 (2.00)
PBM14/2M 14el parabeam	£40.80 (2.50)
5XY/2M X'd 5 element	£20.70 (1.50)
8XY/2M X'd 8 element	£25.80 (2.00)
10XY/2M X'd 10 element	£34.30 (2.00)
Q4/2M 4el quad	£21.50 (1.50)
Q6/2M 6el quad	£28.50 (2.00)
D5/2M 5 over 5	£18.30 (1.50)
D8/2M 8 over 8	£24.85 (2.00)
SVMK vertical Kit	£6.60 (1.25)
UGP/2 Ground plane	£9.35 (1.25)
HO/2M 2m halo	£4.25 (0.75)
HM/2M Above with 24" mast	£5.05 (1.00)
C8/70cm 8db colinear	£45.40 (2.50)
D8/70cm 8 over 8	£20.45 (2.00)
PBM18/70 18 el parabeam	£24.75 (2.00)
MBM/48 70 el Multibeam	£28.20 (2.00)
MBM88/70 88 el Multibeam	£37.50 (2.00)
8XY/70 8 el X'd yagi	£31.05 (1.50)
12XY/70 12 el X'd yagi	£38.50 (2.00)
D15/1296 15 over 15	£30.95 (1.50)

ACCESSORIES

9502 rotator	£55.80 (1.75)
KR400 rotator	£105.80 (2.00)
AR40 rotator	£54.50 (1.50)
Stolle 2030 rotator	£55.00 (1.50)
Stolle 2010 rotator	£50.00 (1.50)
Stolle 2050	£39.95 (1.50)
SWL ATU	£16.50 (0.75)
Shure 444 microphone	£27.50 (0.75)
Shure 201 microphone	£11.75 (0.75)
Shure 526T microphone Type II	£36.35 (0.75)
Hand morse key	£9.70 (0.50)
MM202S Safety microphone	£20.95 (0.50)
50ohm balun	£11.25 (0.50)
UR67 per metre	£0.62 (0.05)
UR43 per metre	£0.22 (0.03)
5 core cable per metre	£0.30 (0.03)
HP3A high pass filter	£3.00 (0.20)
Drake low pass filter	£18.40 (0.75)
TV1 ferrite rings	£0.35 (0.05)
Plastic antenna insulators	£0.25 (0.05)
Twin SWR meters 3-150mHz	£13.50 (0.50)

JAYBEAM (HF)

TB 3 ele 2kW Beam	£155.00 (2.00)
VR3 Triband vertical	£39.00 (2.00)

HILOMAST LTD

PNAM-1 Telescopes to 9m	£271.00 (15.00)
PNAM-2 Telescopes to 14¼m	£331.00 (16.00)
SAE for details.	

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WITH THE **Western** 2-YEAR WARRANTY

FT-107M
All-new HF transceiver. All solid-state, digital readout, 12 memories (tuneable), notch filter, Audio Peak Filter, IF bandwidth control. **£749**

FT-101Z
Latest in a famous line. A rugged transceiver for 10–160 metres; 2×6146B in PA; IF width control and other features. Good value for money. **£550**

FT-207R
Keyboard operated hand portable with 4 memory channels; 12·5kHz steps; memory scan; 2·5 watts output. **£189**

TS-180S
Solid-state (100W out) HF transceiver with Digitial Frequency Control, 4 tuneable memories and many other fine features. **£795**

R-1000
All-new general coverage communications receiver. Covers 200kHz to 30MHz, digital readout, clock, timer, AC/DC operation. **£289**

TR-2400
The latest "hand-held" with extra features. LCD display for easy legibility; keyboard entry; 10 memories; 1·5 watts output. **AVAILABLE SOON**

TR-2300 — *This Month's Choice!*

We feel that the TR-2300 is simply the best 2 metre FM portable we have seen.

★ Use it portable with its internal Ni-cad batteries.
★ Use it mobile with the help of the MB-2 mounting bracket and VB-2300 power amplifier for 10 watts output.
★ Use it base station from an external DC supply.

All WESTERN TR-2300's are equipped with:-
Auto tone-burst on repeater operation
"Reverse repeater" switch
Connection for telephone-type handset (WESTERN EXCLUSIVE!)

PRICES:-
TR-2300 (inc charger, case, DC lead, battery holders) **£193**
VB-2300 10 watt amplifier **£59**
MB-2 Mobile bracket (takes VB-2300 as well) **£18.95**
Batt-A Set of 10 AA size Ni-cads **£10.35**
RA-1 Helical antenna **£6.90**
NEW! Telephone handset with storage cradle **£12.95**

ACCESS **VISA (Barclaycard)** **HP ARRANGED**

Electronics (UK) Ltd

JANUARY SALE TIME!

ALL BELOW OFFERED WHILE STOCKS LAST . . .

JAYBEAM ANTENNAS (Carriage paid)

10Y/2M	2-metre 10-ele yagi	£23.95
10XY/137	10-ele crossed yagi for 137MHz	£18.95
D15/1296	Double-15 for 1296MHz	£24.95
XD/2M	Crossed dipoles for 2 metres	£9.95
D5/2M	5-over-5 slot fed, 2 metres	£16.85
D8/2M	8-over-8 slot fed, 2 metres	£20.95
SVMK/2M	Kit for vertical polerisation of slot fed ants	£4.95
PMH/2C	Circular polarising harness, 2 metres	£5.85

WILSON ANTENNAS (Carriage paid)

M615	6-ele, 15 metre beam	£95.00
DB62	6-ele, 20m; 2-ele 40m	£365.00
DB76	7-ele, 15m; 6-ele 10m	£155.00
DB67	7-ele, 20m; 6-ele 15m	£355.00

TRANSCEIVERS etc (All *Brand New* unless other wise stated—carriage paid)

Alda 105	5-band solid-state transceiver	£465.00
Yaesu FT-301D	HF transceiver (one only)	£595.00
Yaesu FP-301D	De-luxe PSU with auto-ident and clock	£129.00
Yaesu FT-101E	No description necessary!	£529.00
Yaesu FT-620B	6 metre multimode transceiver	£249.00
Yaesu FTV-650B	6 metre transverter (slightly marked case)	£99.00
Yaesu	Speaker cabinets (match FT-101E/B etc)	£11.50
Standard C146A	Hand-held, 2m	£109.00
Standard SY200	Synthesiser (122·6 to 124·6MHz output)	£49.00
Alpha W-63	2m FM rig; 23 channels + 4 scan (fitted 4S, 5R)	£149.00
Western 70TV	70cm transverter, 10 watts	£89.00

VALVES
6AM6, 6AN8, 6AH6, 6AV6, 6AW8, 6BA6, 6BE6, 6BM8, 6BN8, 6BQ5, 6BZ6, 6CB6, 6CH6, 6CL6, 6EA8, 6EH6, 6EH7, 6EJ7, 6EW6, 6GW8, 6U8, 12AT7, 12AU7, 12AX7.
ALL ONE PRICE . . . . at 75p ADD—P&P 50p up to 10, over 10 £1.00, over 50 POST FREE.

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A NEW FACILITY FOR OUR CUSTOMERS—THE WESTERN CREDIT CARD!
Send now for full details and application form—DON'T DELAY!

NEW

PANORAMA

A new range of modular VHF/UHF antennas for mobile use. Stainless-steel whips and plated hardware for durability; moulded parts in grey plastic.

AV/C58M/145:	2 metre, ⅝ wave whip with matching coil	**£6.15** (carr. £1.73)
ACU/433:	70cm 3dB gain colinear	**£5.35** (carr. £1.73)
M4:	Fixed base; needs ½" dia hole to mount	**£2.75** (carr. £0.40)
MB:	"No hole", boot-lip mount complete with 4 metres of UR76 coax	**£4.45** (carr. £0.69)
MM:	Magnetic mount complete with 4 metres UR76 coax	**£12.95** (carr. £0.92)
HJ:	Hinge joint to allow 180° adjustment	**£2.95** (carr. £0.40)
SM:	Heavy gauge spring shock mount	**£4.60** (carr. £0.40)

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Features:
★ 160 to 10 metres ★ 2000W PEP input SSB ★ 1000W DC input CW, RTTY, SSTV, ★ Forced air cooling ★ Self-contained PSU ★ 4 × 572B valves in grounded grid ★ Only 42lbs, 6" × 14½" × 14½" small.

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ZYCOMM Z5800 Hand Portable

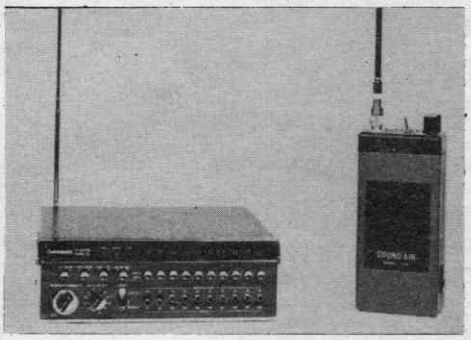
A no nonsense sythesised rig, free of gimmicks yet offering high power and good sensitivity. Covers 144-148 MHz with channels in 5 KHz spacing selected by decade switches. Slide switches control simplex or repeater and high or low power operation. Low power level is adjustable by internal preset. Maximum power (5 watts nominal) may exceed 7.5 watts from internal NiCd battery pack. Antenna has BNC connector.

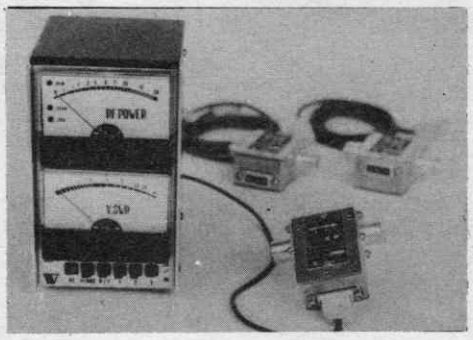
Desk mount and mobile supply/charger units available. A remote microphone/speaker unit with PTT switch available to simplify mobile or body worn operation.

Brief Specification

Transmitter		**Receiver**	
RF Output	Lower Power and 5W	Sensitivity	10 db SINAD for 0.2 microvolt
Deviation	Up to ±5KHz	Selectivity	80 db at 12.5 KHz
Spurious Emission	Better than −60bd	Intermodulation	−60 db
Repeater Shift	±600 KHz	Image and Spurious Response	−65 db
Tone Burst	1750 Hz	Audio Output	500 mW — less than 10% distortion

INTRODUCTORY PRICE: £199 including VAT





FM SCANNING MONITORS

Pocket Model — 008, covers 8 channels in 2m or marine bands. Lockout on all channels. Wide range of accessories supplied.

PRICE: £59.00 including VAT

Three band monitor allows 20 channels in 430-470 MHz, 140-175 MHz and 68-88 MHz ranges to be scanned in user programmable order. Mains or battery operation. Vehicle mount supplied.

PRICE: £95.00 including VAT

Crystals to Suit: Stock frequencies £3.00 each, special order £6.00 each — including VAT.

VSWR/POWER METER

A direct reading unit with individual sensing heads covering 1.8-30 MHz, 50-150 MHz and 430-470 MHz ranges. Autoranging power meter covers 20W to 2KW (2-200W 430 MHz range) in three ranges. Heads, which can be located remotely, are selected by front panel switches. Constant readout of VSWR from 1:1 to infinity is obtained irrespective of power level, i.e. true indication during speech on SSB.

INTRODUCTORY OFFER: £114.00 inc VAT

Zycomm

Full range of amateur and commercial antennas and Home Office approved two way radio equipment. SAE for details.

160-2m, ALL MODES in one rig...

The first of a revolutionary new product range from Sugiyama ... more news soon

The Ultimate One Time Purchase for Fixed or Mobile Operation

SUGIYAMA F850

An all band (160 to 2m including 4m), all mode transceiver available at a realistic price, with a specification that includes as standard most of the options the discerning amateur considers essential for serious operation. The large digital frequency display, together with the elimination of tuning up, make the unit easy to use. Built in VOX, with fast/slow return times, a speech processor and a 25 KHz marker further enhance the performance of this advanced transceiver.

For 2 metre FM operation, repeater shift and automatic tone burst are provided.

This compact, all purpose transceiver with the ability to operate from mains or battery supplies, makes it an ideal choice for base station, portable and/or mobile service.

Features

- All current UK amateur bands from 1.8-144 MHz (Export model covers 50 MHz in place of our 70 MHz band).
- All popular modes. USB, LSB, CW, FM and AM.
- Wide dynamic range 1.8-21 MHz 100 dB, 28-144 MHz 95 dB.
- Switched selectivity 0.4, 1.2, 1.8 and 2.4 KHz. On FM the selectivity is fixed at 16 KHz (The 0.4, 1.2 and 1.8 KHz filters are options).
- AC or 12V DC powered, for base or mobile/portable operation. The mains supply is integral within the unit.
- Power output 10 Watts minimum on SSB/CW/FM (Typical output 15 Watts) AM 5 Watts.

Please send SAE for descriptive leaflet

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PRICES (inc VAT):- Basic F850 £920.00
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ACCESSORIES

SWR25: This ever-popular twin SWR and Power meter covers 3·5–150 MHz at **£10.50** plus VAT. P&P 50p.

T-435: VHF/UHF swr and power meter with 2/20/120 watt through line power measurement **£29.95** plus VAT. P&P 50p.

DL-30 Dummy load 25W DC-150 MHz **£5.50** plus VAT. P&P 25p.
T-80 80W Dummy load DC-500 MHz **£19.95** plus VAT. P&P 25p.
T-150 150W Dummy load DC-500 MHz **£28.50** plus VAT. P&P 25p.

CT-1 Coax Toggle 3 SO239's **£5.75** plus VAT. P&P 25p.
CT-2 Coax Toggle 2 SO239's 1 PL259 **£5.96** plus VAT. P&P 25p.

OSKER BLOCK RANGE

SWR200B swr/power meter covering 3–200 MHz 50/75 Ohm power range 3–30 MHz, 20/200/2kW, VHF 2/20/200 watt **£34.95** plus VAT. P&P 50p.

SWR300 swr/power meter 3–30 MHz (2m and 70cm with adaptors) power range 20/200/2kW with SPC-2B 20/200W at 2m with SPC07A 2/20W at 70cm. Respective prices **£39.95, £14.95, £18.95** plus VAT. P&P 50p.

SWRVVV meter body only, covers 144/432 MHz with adaptors SPC-2B and SPC 07A, **£19.95** plus VAT. P&P 30p. Adaptors as SWR300.

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HK707	Straight Up/Down keyer	**£8.75**
BK100	Semi auto mechanical bug	**£15.55**
HK702	Up/Down keyer on marble base	**£19.50**
MK702	Manipulator	**£19.50**
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MK705	Squeeze paddle on marble base	**£19.50**

PLUS VAT. P&P 30p.

PX402 13·8V DC 3amp continuous 4amp max fully stabilized power supply with overload protection **£19.95** plus VAT. P&P 50p.

JVL MK2

Base VHF/UHF antennas. These antennas are made to very high standards from the finest quality anodised aluminium; collapsible and ideal for portable or fixed use. Power handling 350W:
JVL144 6dB gain 2m colinear **£32.00** plus VAT. P&P £1.50; **JVL433** 6dB gain 70cm colinear **£32.00** plus VAT. P&P £1.50.

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This small receiver has 12 xtal-controlled channels. Fitted with 9—S0, S20, S22, S23, S24, R4, R5, R6 and R7, and comes complete with ni-cads, charger and carry case, etc.

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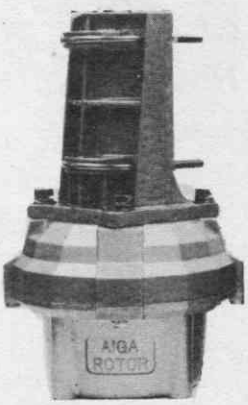

ART3000C

This rotator delivers the highest performance that can be expected of the standard size rotator. The unit has disc brakes to ensure excellent stopping and handles maximum load of 250kg/550lbs. **£79.95** + 15% VAT

ELECTRONIC KEYERS

EK-150

A semi- or fully-automatic squeeze keyer producing dots and dashes in the precise ratio required for perfect code. The speed is adjustable from 0–60wpm. Power inputs 110/240VAC or 9–14VDC. **£65** plus VAT.

MK-1024

As EK-150 but with four memories each capable of storing 256 bits making a total of 1,024 bits. This can be recalled separately or in sequence for one long message. **£117.50** plus VAT.

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PS-7	Power supply for TR-7	£159.85
RV-7	Remote VFO for TR-7	£126.50
L-7	Linear 160-10m 2kW	£747.50
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MN-2700	ATU/CWSR/RF Wattmeter 2kW	£184.00
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TR-4CW	(RIT) Last version of the famous Transceiver	£496.80
AC-4	Power supply for the above TR-4CW	£109.25

Securicor delivery £3.50

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TS820	160–10m transceiver 200W PEP	710.00	3.75
DG1	Digital readout to 100Hz	122.50	1.00
SP820	Speaker	39.00	1.50
VFO820	External VFO	123.50	3.75
YG88C	CW filter 8 pole	38.00	.50
DS1A	12V dc inverter	43.00	1.00
R820	The ultimate matching receiver to the TS820	790.00	3.75
YG455C	CW filter 500Hz	61.50	.50
YG455CN	CW filter 250Hz	69.00	.50
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VFO520S	External VFO	103.00	3.75
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DG5	Digital display/counter	119.50	1.50
DK520	Conversion for older TS520	10.50	.75
TS120S	80–10m mobile transceiver 200W PEP	495.00	3.75
TS120V	80–10m mobile transceiver 20W PEP	408.00	3.75
PS20	AC power supply for TS120V	52.00	3.75
MB100	Mobile mounting bracket	17.00	.75
YK88C	500Hz CW filter	29.00	.50
SP120	External speaker	25.50	1.25
VFO120	External VFO	93.00	3.75
AT120	Antenna tuner (100W)	69.00	1.50
PS30	AC PSU for TS120S	98.00	3.75
AT200	1·8–30MHz antenna tuner	95.00	1.50
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BS5	TS520 scanboard for SM220	49.50	.50
BS8	TS820 scanboard for SM220	49.50	.50
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MC50	De luxe desk microphone dual impedance PTT locking bar	27.50	1.50
MC35S	50K fist microphone	13.30	.50
MC30S	500 ohm fist microphone	13.30	.50
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BPF2A	2m band pass filter 144–146MHz 50W rms 100W PEP	25.20	1.00
RD300	High power dummy load	59.50	.50
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SP70	Matching speaker	20.50	1.00
VFO700S	External VFO	92.00	3.75
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TR7500	2m FM mobile 10W transceiver PLL with all 80 FM channels	240.00	3.75
TR7600	2m synthesised mobile/fixed transceiver 10 watt	247.25	3.75
TR7625	2m synthesised mobile/fixed transceiver 25 watts	273.70	3.75
RM76	Microprocessor control unit	74.50	1.00
PS6	AC PSU for TR7500/7600	59.50	3.75
TR2300	2m FM portable transceiver PLL with all 80 FM channels	199.00	3.75
VB2300	10W booster	59.30	1.00
MB2	Mobile mount	18.90	1.00
RA1	Helical rubber antenna	6.90	.25
VB2200GX	10W PA for TR2200G/GX	46.00	1.00
PS1200	Power unit and charge TR2300/3200/2200GX	29.50	1.00
TS180S	160–10m solid state transceiver	712.00	3.75
TS180S	As above but with digital frequency control	825.00	3.75
VFO180	External VFO	120.75	1.00
SP180	Speaker	42.70	1.00
DF180	Digital frequency control	t.b.a.	
AT180	1·8–30MHz antenna tuner	t.b.a.	
PS30	AC power unit for TS180S	98.00	3.75
TR8300	70cm FM mobile 10W transceiver fitted 4 channels	250.00	3.75
TR3200	70cm FM handy transceiver fitted 3 channels	190.00	3.75
MB1A	Matching mobile mount	9.20	1.00
PB10	Pack of 10 ni-cad batteries	10.35	.50
PB15	Battery pack (moulded case)	20.25	.50
	Spare power lead	1.30	.15
TR7010	2m SSB/CW mobile transceiver 10W output	193.00	3.75
R300	General coverage receiver	189.00	3.75
HS5	Communications headphones, tailored response	23.50	.75
HS4	Communications headphones, tailored response	10.75	.75

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CS1577	Dual trace 30MHz with signal delay	552.00	3.75
CS1566	Dual trace 20MHz	397.00	3.75
CS1560A	Dual trace 15MHz. 10mV/cm on X and Y	374.00	3.75
CS1562A	Dual trace 10MHz. Auto run and trigger TB	310.00	3.75
CS1352	Dual trace 15MHz battery portable	402.50	3.75
B7-7E	Battery pack	34.50	1.75
The above five scopes are complete with matching probes.			
CS1575	Dual trace with auto phase display. 1mV sens	319.50	3.75
CO1303D	Single trace 5MHz service/student scope	132.00	3.75
DM800	Multi-purpose dip meter	59.80	1.00
AG202	Sine/square audio generator. 20Hz 200kHz	82.80	3.75
AG203	Sine/square audio generator. 10Hz 1MHz	132.00	3.75
SG402	Service shop RF generator. 100kHz 30MHz	66.50	3.75

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FT107M

NEW SOLID STATE HF TRANSCEIVER

FULL EQUIPMENT MODEL WITH MEMORY FEATURE*

If you have been searching for an all solid state HF transceiver with a "broad band" output that will deliver 75 per cent of maximum power into a 3:1 load, then look no further than this top of the line Yaesu. The FT107M covers 160–10M (plus) and is fully equipped with: variable IF bandwidth, audio peak/notch filter, RF speech processor, variable threshold noise blanker, full metering—including SWR, and boasts a schottky diode ring mixer for excellent receiver dynamic range. The all new memory system provides 12 stored channels (with fine tuning), scanning from the optional microphone and the exclusive DMS—digital memory shift. This system using a photo interruptor (with fine tuning) to control the 100Hz synthesizer thus providing any offset up to 500kHz—from the memory channel.

A full list of accessories is available to complement the FT107M. The illustration below shows (reading from left to right): the SP107P speaker/phone patch (normal speaker SP107 available); the FTV107R two band transverter (two from 432, 145 or 50MHz); the FT107, itself, the FV107 remote VFO (with 5 crystal channels); the FC107 antenna coupler with twin VSWR/power meters, and the FP107E AC psu with speaker.

Not illustrated is the FP107 slide-in AC PSU, or the microphone range. (YM34 desk—YM35 hand c/w scanning control—YM36 noise cancelling—YM37 hand).

For further details of this exciting new system, please contact any authorised sales outlets for a free colour brochure. Or better still, see it for yourself, try one out today!!!

- ★ 160–10 meters plus WWV plus 2 auxilliary bands
- ★ USB-LSB-CWW-CWN-FSK-AM operation
- ★ All solid state, including final amplifier
- ★ Full broad band "no tune" power amplifier
- ★ 240W PIP. 75 per cent power output at 3:1 VSWR
- ★ 12 memory channels with clarifier on memory*
- ★ Digital Memory Shift gives offset from memory*
- ★ Up/down scanning control from microphone*
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- ★ Bandwidths: 6kHz*, 2·4kHz–300Hz, 600Hz–300Hz*
- ★ Selectable CW "fixed" widths CW-W and CW-N*
- ★ Tunable Audio Peak (AFP) and Notch filter
- ★ Diode ring mixer for high Rx dynamic range
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- ★ Vox built in and adjustable from the front panel
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- ★ Clarifier (RIT) switchable on Tx, Rx, or on both
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- ★ Plug in circuit boards and mother board

**Optional*

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KDK FM2016E 2m FM DIGITAL SYNTHESIZED TRANSCEIVER

The KDK FM-2016E is a 12V DC two metre FM transceiver for mobile and base station use. It has been compactly designed with emphasis on maintenance and ease of use by using the latest CMOS IC digital PLL circuitry.

Rx 144·000–148·995MHz and Tx 144·000– 145·995MHz.

Direct readout of operating frequencies by large size LEDs.

The most commonly used, 100kHz and 10kHz, switches are mounted coaxially. These will not go below the 0 or above 9 position facilitating frequency changing by feel only, for "eyes-on-the-road" motoring and use by those with impaired sight.

An electronic memory using CMOS RAMs (Random access memory ICs drawing only 25nA!) allows any four out of the 1,000 channels to be written-in (stored) at a flick of a switch. An auto-charging back up NiCad battery maintains the RAMs contents after disconnection from the power.

The plus 600kHz and minus 600kHz positions of the mode switch provide for normal repeater operation. In position 1T–2R the set Tx's on the frequency in memory channel 1 and Rx's on memory channel 2 (likewise the 3T–4R position). This provides for non-standard shifts, and is also convenient for use in conjunction with up-converters.

The memory may be scanned in the "closed" mode, (the scanner will stop at the first channel in use) or in the 'open' mode, (stopping at the first empty channel). Scan-hold allows transmission immediately the scanner stops.

Dual-gate MOS-FETs are used for the RF and mixer to provide superior inter-modulation characteristics with high sensitivity. Performance is held constant across the wide frequency range covered, by automatic electronic tuning.

A monolithic crystal in the first IF and a commercial quality 15-pole ceramic filter in the 2nd IF provides extremely sharp selectivity. The 2nd IF is built with discrete components to keep stray coupling to a minimum and a ceramic discriminator has been adopted for excellent temperature stability and long-term alignment.

The RIT (Receiver incremental tuning) and centre zero meter are useful for contacts with off-frequency or drifting stations.

The single conversion transmitter uses a balanced mixer, five stages of electronic tuning, and a four-stage low pass filter for a clean, spurious-free signal.

The ultra-modern silicon transistor in the final will survive even an infinite VSWR.

Power: HIGH (15 Watts) and LOW (1 Watt), is selectable by a front panel switch (useful with a linear).

Direct FM of the VCO results in superb audio.

A two mode (burst or continuous) tone generator is adjustable from 1,750 to sub-audible frequencies.

A 5-pin "DIN" connector is provided on the rear panel for a KDK SC-12A SELCALL (tone encoder-decoder) unit, headset-microphone combinations or similar.

£240 inc. VAT at 15% (£208.70 + VAT) **SEE ONE TODAY**

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Available between heights of 25–120ft post, base plate, wall, fixed base or mobile on high-speed trailers.

Price of towers are for the complete package—tower sections, mounts, telescopic and luffing gear, guys, head unit and winches.
AS APPROPRIATE FOR ANY PARTICULAR MODEL

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STANDARD 13M20 SERIES				*HEAVY DUTY 16M20 SERIES*			
Post Mounting 13M20				*Post Mounting* 16M20			
P25	25′	Tower	£202.00				
P40	40′	Tower	£276.75	P40	40′	Tower	£416.20
P60	60′	Tower	£335.90	P60	60′	Tower	£472.50
Fixed Base 13M20				*Fixed Base* 16M20			
FB25	25′	Tower	£150.20				
FB40	40′	Tower	£224.40	FB40	40′	Tower	£333.80
FB60	60′	Tower	£284.10	FB60	60′	Tower	£390.10
Socket Types 13M20				*Socket Types* 16M20			
SP25	25′	Tower	£234.90				
SP40	40′	Tower	£309.20	SP40	40′	Tower	£461.50
SP60	60′	Tower	£368.90	SP60	60′	Tower	£517.60
Base plate 13M20				*Base plate* 16M20			
BP25	25′	Tower	£236.10				
BP40	40′	Tower	£309.55	BP40	40′	Tower	£433.40
BP60	60′	Tower	£368.80	BP60	60′	Tower	£489.70
Wall Mounting 13M20				*Wall Mounting* 16M20			
W25	25′	Tower	£162.70				
W40	40′	Tower	£236.90	W40	40′	Tower	£340.80
W60	60′	Tower	£296.60	W60	60′	Tower	£392.50

80-85-100-120′ and MOBILES PRICES ON APPLICATION

NEW '30ft': 10ft SECTIONS

P30 £249
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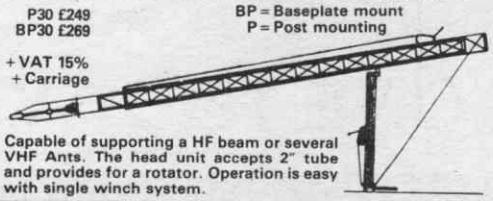
BP = Baseplate mount
P = Post mounting



Capable of supporting a HF beam or several VHF Ants. The head unit accepts 2" tube and provides for a rotator. Operation is easy with single winch system.

SOUTH MIDLANDS COMMUNICATIONS LTD

OSBORNE ROAD, TOTTON
SOUTHAMPTON SO4 4DN

SMC

Telex: 477351 SMCOMM G
Tel: Totton (0703) 867333

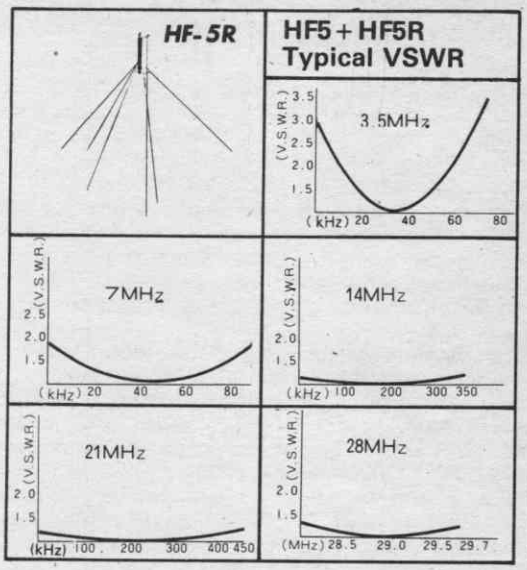
SMC-HS

FIVE BAND VERTICAL ANTENNA

Only 15′ 9″ high (4.8m) and around 1⅝″ in diameter (4.2cm). This remarkable new antenna operates on 80, 40, 20, 15, and 10 metres. Power handling of 500W PEP on 10, 15 and 20m and 200W PEP on 40 and 80m, within its 1.5:1 V.S.W.R. bandwidth.

The SMCHF5 weighs only 6lb 6ozs (2.9kg) and is suitable for mounting at ground level on a good earth post (with or without radials) or in an elevated position with wire radials or better still the HF5R.

THE SMCHF5R Radial kit, with power handling capabilities of 150W PEP weighing only 4lbs (1.8kg) is the perfect answer to restricted locations, consisting as it does of five solid rods of similar length 6′ 6″–7′ 3″ (2.05–2.2m) sloping at 45° to the antenna.



SMCHF5V and SMCHF5R are available from reputable amateur radio dealers throughout Britain.

SMCHF5V £35.00 + 15% VAT, £40.25 Ex-works
SMCHF5R £23.35 + 15% VAT, £26.85 Ex-works

Securicor delivery (£3 irrespective of quantity) is offered direct from SMC HQ and branches.

Check out our exciting new range of mobile and VHF colinear antennas today.

SOUTH MIDLANDS COMMUNICATIONS LTD

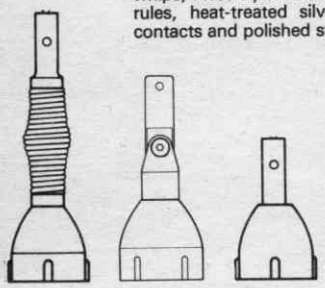
OSBORNE ROAD, TOTTON
SOUTHAMPTON SO4 4DN

Telex: 477351 SMCOMM G
Tel: Totton (0703) 867333 (3 lines)

ASCOT

VHF MOBILE ANTENNAS HIGH-GAIN: FIVE-EIGHTS

Manufactured in the UK, designed to withstand extremes of weather by using; fine stainless steel whips, A100 nylon bases, chrome-plated brass ferrules, heat-treated silver-plated beryllium copper contacts and polished stainless steel shock springs.



- ★ 130–175MHz
- ★ 3dB Gain
- ★ 5MHz Band
- ★ 1·5:1 max
- ★ 100W Rated
- ★ 50 ohm nom.

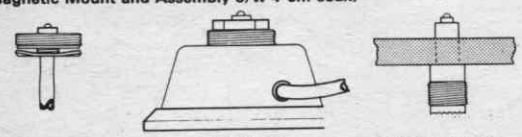
NB. Complete aerial consists of base plus whip plus mount.

Sprung (341) £6.65	Swivel (330) £4.45	Standard (440) £3.50	Whip (057) 127cm stainless £1.95

CHOOSE THE MOUNT (All fit the above)

BASE CONNECTORS

(Magnetic Mount and Assembly c/w 4·5m coax)

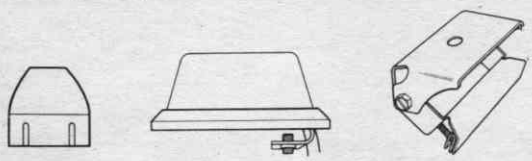


STANDARD (085) £2.80	MAGNETIC (092) £8.95	FIBRE-GLASS (095) £2.10

ADD AN ACCESSORY (if required)

MOUNTS & COVERS

universal type fitting the standard cable assembly



Blank-off (031) £0.80	Boot-lip (093) £2.90	Gutter clip (089) £4.75

Ascot antennas are available from reputable amateur radio dealers throughout Britain.
Mail order (£1.00 complete antennas or £0.50 for accessories) is offered direct from SMC HQ and Branches.
Further details and illustrated leaflet on the full range of $\frac{1}{4}\lambda$ and $\frac{1}{2}\lambda$ antennas are available.
NB. All prices exclude VAT at 15%

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HANSEN

PEP & LEVEL RESPONSE IN-LINE WATTMETERS

The FS700 series are flat frequency response, peak envelope power and R.M.S. in-line wattmeters with many novel features. The most notable being the 'power independent' SWR scale—no forward power calibration knob, just a direct reading SWR scale. Get into the Hansen habit today.

Specifications	FS700H	FS700V
Freq. Range	1·8–60MHz	50–150MHz
Power FSD	15,150, 1·5kW	15,150W
V.S.W.R.	1:1 to 4:1 and 1:1 to 20:1	
Accuracy	±7% of FSD	
Impedance	50–52 Ohms	
Connectors	SO239	
Power	240 Volts AC	
Weight	3·3lbs (1·5Kgs)	
Size overall	8" × 4" × 5½" (205 × 100 × 140mm)	
Size Meter	2" × 3¼" (51 × 97mm)	
Time Const.	PEP follow 4 seconds	
	PEP Hold 600 seconds	
	FS700H & FS700V	**£68.00**

FS500

PEAK READING WATTMETER
Power RMS and PEP ±7% FSD
SWR Measurement 1–5:1
Size 8" ×4" × 5½"

FS500H	1·8–60MHz	20, 200 & 2kW	£59.00
FS500V	50–150MHz	20 & 200W	£59.00

FS60*

PEAK READING WATTMETER
Power RMS & PEP ±10% FSD
SWR measurements 1–3:1 ±3%
SIZE 6½", 2¾", 4½"

FS601MP	1·8–30MHz	20 & 200W	£40.00
FS601MO	1·8–30MHz	200 & 2kW	£40.00
FS602M	50–150MHz	20 & 200W	£40.00
FS603M	430–440MHz	5 & 20W	£40.00

Hansen Wattmeters are available from reputable amateur radio dealers throughout Britain.

Mail order service (£0.75 post and packing) is offered direct from SMC or any branch.

The range encompasses level response wattmeters and remote indicator types. Please contact your stockist for further details.

NB. Prices do not include VAT 15%.

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South Midlands

WISHING ALL RADIO AMATEURS

FT901DM £800

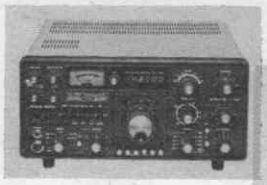
FT901D Transceiver	£710.00
FT901DE Transceiver	£700.00
YR901 Morse/TTY read	£395.00
YVM-1 Video Monitor	£125.00
FTV901 Transvertor	£245.00
430-440 70cm module	£160.00
50-54 6m module	£60.00
70-74 4m module	£75.00
YO901 Monitorscope	£240.00
YO901P YO901 with pan	£280.00
PAN KIT Mod kit	£47.00

FC901 Antenna Tuner	£115.00
FL2100Z Linear Amp.	£355.00
FV901DM Synth. Ext. VFO	£215.00
SP901 External speaker	£24.00
SP901P Speaker/patch	£44.50

FT107M £660.00

FV107 Ext. VFO	£80.00
FC107 Antenna Tuner	£92.50
FP107E AC PSU Extnl.	£92.50
FP107 int. AC PSU	T.B.A.
FTV107 Transvertor frame	£96.50
FTV107(2) Transvertor	£181.50
430-440 70cm module	£158.50
144-148 2m module	£68.50
50-54 6m module	£68.50
MEM/DMS Memory	£87.00
Filter CW or AM	£20.00

SP107 External speaker	£24.00
YM34 Mic. desk	T.B.A.
YM35 Mic. hand. scan	T.B.A.
YM36 Mic. noise cancel	T.B.A.
YM37 Mic. Hand	T.B.A.



FT101ZD £575

FT101Z Transceiver Analogue	£500.00
Count Analogue/Dig. kit	£80.00
DC-DC 12V invertor kit	£30.00
YE Hand microphone	£7.50

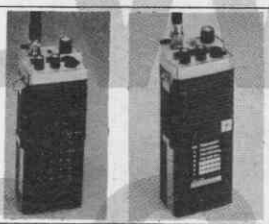
FT7B £375

TRANSCEIVER 80-10M Compact
All solid state. VFO control
SSB & CW. 100W PEP.
YC7B Digital Readout £60.00

FT225RD £485

Multi mode USB/LSB/CW/AM/FM
25W 2-metre Transceiver
12V DC & 230V AC 50Hz
Digital Readout to 100Hz
Sensitive Rx and clean Tx

FT225R Transceiver Analogue	£445.00
MEM Memory	£85.00
COUNT Counter kit	£50.00



FT207R £173

NC-1A Slide in charger	£16.50
NC-2 Charger/eliminator	£34.50
NC-9C Small charger	£6.50
NBP-9 Ni Cd pack spare	£14.50
YM24 Speaker/mic	£14.50
FT202R Transceiver	£103.50
NC-1 AC Charger	£16.50
PA-1 12V PSU	£16.50

CPU2500R £292

CPU2500RSt	25W c/w Stepper	£319.00
CPU2500RS	10W Standard	£272.00
CPU2500RSSt	10W c/w Stepper	£279.00
CPU2500RK	25W Key mic.	£308.00
CPU2500RKSt	25W Key, step	£335.00
CPU2500RKS	10W Key mic.	£292.00
CPU2500RKSSt	10W Key, step	£319.00

FT227RB £229

10W FM 2-metre Synthesized.
'Single-knob tuning. 10kHz (+5 up)
Transceiver up/down and scan from microphone FT227RBSt
Fitted 25Hz stepper £247.83
As FT227RB less mic control but with scanner, lock out, pause etc.
FT227RXS Fitted SMC Scanner £252.17

FRG7000 £327

Communications Rx 250kHz-30MHz
SSB-2·4kHz Bandwidth
AM-6kHz Bandwidth
Digital Readout. CPU Control Clock/timer. Sensitive

FRG7 £185

Communication Rx 0·5-30MHz
SSB/CW/AM Mains and DC volts

FRG7D FRG7 Digital	£235.00
SMCC7 SMC Digital Readout	£50.00
Tray Internal Battery tray	£4.35

YD844 £19.50
Desk Microphone

YD148 £18.50
Desk Microphone

YM21 £12.00
Noise cancelling Mic

YH55 £8.75
Padded Phones

QTR25D £22.50
World Time Clock

FP12 £67.50
12Amp 12V PSU

FP4 £35.00
4Amp 12V PSU

YP150 £58.50
Wattmeter/Load

PRICES EXCLUDE VAT (15%) BUT INCLUDE DELIVERY—SECURICOR/POST IN THE UK

SOUTH MIDLANDS COMMUNICATIONS LIMITED.

OSBORNE ROAD, TOTTON
SOUTHAMPTON, SO4 4DN
Hours of business:
9-5.30 Monday-Friday
9-1.30 Saturday

Head Office, Showrooms
Cables: Aerial Southampton
Telex: 477351 SMCOMM G
Tel: Totton (0703) 867333 (3 lines)

A	G3ZUL	Brian	Stourbridge	(03843) 5917
G	GI3KDR	John	Bangor	(0247) 55162
E	GM8GEC	Jack	Edinburgh	(031665) 2420
N	GI3WWY	Mervyn	Tandragee	(0762) 840656
T	GW3TMP	Howarth	Pontybodkin	(035287) 846/324
S	GW4GSW	Alan	Swansea	(0792) 24140

Communications Ltd

A VERY HAPPY NEW YEAR

YAESU FROM SMC

THE BEST OF TODAYS COMMUNICATIONS EQUIPMENT WITH TWO YEAR GUARANTEE AND SECURICOR DELIVERY

AN INVITATION, GIVE OUR SERVICE A TRY; MAIL ORDER, TELEPHONE OR PERSONAL CALLERS

Visit our showrooms and service facilities. Examine the best.
Weekdays; 9 till 5.30 Saturdays 9 till 1.30, at our Totton HQ
M271 one mile, parking for 100+ on the doorstep. Rail station 300 yards.
If Totton is too remote try: Leeds, Chesterfield, Woodhall Spa or any SMC Agent.

REMEMBER: When you deal with SMC you get:

The SMC two-year guarantee. The speedy free Securicor service.
The security of dealing direct with the largest authorised importer.
The spacious, very well equipped, ably staffed test and service facility.
The knowledge that we carry tens of thousands of pounds of spare parts.
Our discreet 'instant' H.P. Our personal export documentation scheme.
Our in-person, or over the 'phone, time saving credit card acceptance.
Our honest advice and evaluation of part exchange equipments' worth.
Our deep interest and knowledge of most facets of our common hobby.

REMEMBER YAESU PRICES ARE LOWER THAN 12 MONTHS' AGO.

Thanks to increased production from the Worlds leading Amateur Radio Manufacturer and taking inflation into account, prices are perhaps 25% less in real terms than a year ago

Whether you seek the very best or the best value for money. It has to be:-

YAESU MUSEN FROM SOUTH MIDLANDS COMMUNICATIONS

REMEMBER: YAESU'S WORLD WIDE WINNERS : FT101Z, FT225RD, FT901DM
AND THE LATEST RADIO'S FOR THE EIGHTIES : FT207, FT107M, FT720R*
PLUS MUCH, MUCH MORE ARE ALL HELD FROM STOCK FOR IMMEDIATE DELIVERY

We also provide the widest range of complementary accessories and bits and pieces.

Access

S.M.C. (Jack Tweedy) LTD
Roger Baines, G3YBO
79 Chatsworth Road
Chesterfield, Derbyshire
Chesterfield (0246) 34982
9-5; Tuesday-Saturday

NORTHERN (Leeds) BRANCH
Colin Thomas G3PSM
257 Otley Road,
Leeds 16. Yorkshire.
Leeds (0532) 782326
9-5; Mon-Wed & Fri-Sat.

S.M.C. (Jack Tweedy) LTD
Jack Tweedy, G3ZY
150 Horncastle Road,
Woodhall Spa, Lincolnshire
Woodhall Spa (0526) 52793
9-5: Tues-Sat (+appointments)

BARCLAYCARD VISA

South Midlands

WISHING ALL RADIO AMATEURS

ASCOT ANTENNAS VHF MOBILE (Carriage £0.95) + VAT 15%

340	¼λ	Standard Base	£2.10	085	¼ & ⅜	Cable Assembly	£2.80
310	¼λ	Swivel Base	£3.50	095	¼ & ⅜	Fibreglass Mount	£2.10
344	¼λ	Sprung Base	£5.55	092	¼ & ⅜	Magnetic Mount	£8.95
440	⅝λ 2m	Standard Base	£3.50	084	¼λ	Cable Assembly	£4.15
330	⅝λ 2m	Swivel Base	£4.45	088	¼λ	Cowl Mount	£4.95
341	⅝λ 2m	Sprung Base	£6.65	091	¼λ	Magnetic Mount	£9.80
350	¼λ 2m	Fine Tune Base	£7.15	089		Gutter Mount	£4.75
351	¼λ 2m	Sprung 350 Base	£8.25	093		Boot mount	£2.90
057		127cm Tapered Whip	£1.95	031		Blank off ¼λ & ⅝λ	£0.80
056		63cm Parallel Whip	£0.95	044		Blank off ¼λ	£0.45

BANTEX VHF MOBILE ANTENNAS (Carriage £0.90) + VAT 15%

42SS	¼λ 4m	Stainless whip	£1.75	B5U	⅝λ	70cm whip	£2.10
40GF	¼λ 4m	Glass whip	£3.55	UCL	¼ & ½	70cm Colinear	£6.45
20SS	¼λ 2m	Stainless whip	£1.50	UDL	⅜ & ½	70cm Colinear	£11.95
18GF	¼λ 2m	Glass whip	£2.80	BM		Standard base ½"	£1.65
B5	⅝λ 2m	Glass whip	£7.75	BC		Claw base	£3.50
BGASS	¼λ 2m	Stainless whip	£8.60	BD		Trunk lip base	£5.50
BGAGF	¼λ 2m	Glass whip	£9.10	BMM		Magnetic base	£10.95

SMC–HS (Carriage Extra) + VAT 15%

SMC15SE	¼λ	15m	1.72m	£11.00	GDX2	Discone 50-580MHz	£39.50
SMC10SE	¼λ	10m	1.72m	£11.00	GDX1	Discone 80-480MHz	£37.00
SMC2NE	⅜λ	2m	1.30m	T B A	VHFL	Rx Discone 65-520MHz	£15.00
SMC78F	¼λ	2m	1.75m	£10.00	LT606	Log Per. 50-500MHz	£75.95
SMC78B	⅜λ	2m	1.72m	£11.00	VS-BNC	Helical 145MHz BNC	£3.85
SMC258	⅜ + ⅜	70cm	0.94m	£10.00	145PL	Helical 145MHz PL259	£3.00
RG4M	Cable Assembly			£3.00	156PL	Helical 156MHz PL259	£4.35
GSS	Gutter clip			£5.00	GPV-5	Colinear 145MHz 6.5dB	£21.74

JAYBEAM VHF FIXED ANTS (Carriage extra) + VAT 15%

4Y/4M	4 element yagi	£14.95	5XY/2M	5 element crossed	£18.00		
PMH2/4M	2 way harness	£10.60	8XY/2M	8 element crossed	£22.50		
D15/23	15 over 15 slot	£26.90	10XY/2M	10 element crossed	£29.80		
UGP/2M	Ground Plane	£8.15	PMH2/C	Circular harness	£5.90		
C5/2M	Vert Colinear	£34.80	PMH2/2M	2 way harness	£7.80		
5Y/2M	5 element yagi	£8.90	PMH4/2M	4 way harness	£18.70		
8Y/2M	8 element yagi	£11.50	C8/70	Vert. Colinear	£39.50		
10Y/2M	10 ele long yagi	£24.70	D8/70	8 over 8, slot fed	£17.80		
14Y/2M	14 ele long yagi	£31.50	PBM18/70	18 ele. Parabeam	£21.50		
PBM10/2M	10 ele Parabeam	£29.20	MBM48/70	48 ele. Multibeam	£24.50		
PBM14/2M	14 ele Parabeam	£36.50	MBM88/70	88 ele. Multibeam	£32.60		
Q4/2M	4 element quad	£18.70	8XY/70	8 element crossed	£27.00		
Q6/2M	6 element quad	£24.80	12XY/2M	12 element crossed	£33.50		
D5/2M	5 over 5, slot fed	£15.90	PMH2/70	2 way harness	£6.75		
D8/2M	8 over 8, slot fed	£21.60	PMH4/70	4 way harness	£14.30		

G-WHIP HF MOBILE ANTENNAS (Carriage £0.95) + VAT 15%

TRIBANDER	10-20M Slide	£20.00	FLEXIWHIP	10M Mast	£14.40
LFCOIL	40/80/160M	each £5.70	FF	15/20/40/80/160M each	£5.70
LFWHIP	Telescopic	£2.60	GW BASE	Standard base	£3.65
MULTIMOBILE	10-20M Auto	£23.00	35BASE	Heavy Duty base	£5.00
MMCOIL	40/80/160M	each £5.70	TA	35 to G-Whip	£0.80
MMWHIP	Telescopic	£2.60	EXTENDAROD	Extension	£9.50

GEM QUAD FIBREGLASS 10-20M (Carriage £2-£9) + VAT 15%

GQ2E	2 Element quad	£124.00	GQ4E	4 Element quad	£249.00
GQ3E	3 Element quad	£187.00	GQCK11	Element Conversion kit	£63.00

MOSLEY TRI-BAND BEAMS (Carriage £3.50) + VAT 15%

TA32	2 ele. 200W RMS	£70.00	MUSTANG2	2 ele. 1KW RMS	£95.00
TA33	3 ele. 200W RMS	£105.00	MUSTANG3	3 ele. 1KW RMS	£130.00

SMC TRAPPED DIPOLES 10-80M. (Post £0.75) + VAT 15%

S500	Standard—14 SWG	£26.50	P500	Portable—Cu/Terylene braid c/w 75ft feeder	£32.50
HP1K	High Power—14 SWG	£29.00			

WIRE & BRAIDS (Post and Packing extra) + VAT 15%

7/029H	Cu Hard Drawn	yd £0.15	14 SWG	Cu Hard Drawn	yd £0.13
7/036H	Cu Hard Drawn	yd £0.18	BRAID	Cu/Terylene, ⅛"	yd £0.14
7/044H	Cu Hard Drawn	yd £0.24	7/029S	Cu Soft Drawn	yd £0.13

AERIAL INSULATORS (Post Extra) + VAT 15%

SMCP1	3" Polyprop. ribbed	£0.37	EGG1	1½" Egg porcelain	£0.33
SMCP2	8¼" polyprop. ribbed	£1.85	IP3	3" Porcelain ribbed	£0.48

WIGHTRAPS AERIAL TRAPS (Post £0.40) + VAT 15%

WTS	Standard—White	£5.85	WHTB	"Space Saver", 3·5MHz resonance, for 1·8MHz	£7.50
WTHP	High Power—Blue	£8.25			

BALUNS 3-30MHz (Post £0.50) + VAT 15%

BN86	1:1, "U" bolt mount	£13.50	W2AU1	1:1, c/w spark gap	£9.50
HIQ	1:1, "Hang up" Type	£8.70	W2AU4	4:1, c/w spark gap	£9.50

LIGHTNING ARRESTORS COAXIAL (Post £0.30) + VAT 15%

SM566	Spark, SO239/PL259	£2.55	NSK7S	Gas, SO239/SO239	£7.50
SM567	Spark. SO239/SO239	£2.55	LA1	Gas, Bulkhead	£39.50

CABLES RF FEEDERS (Carriage extra) + VAT 15%

RG58U	50Ω 0·2" Stranded	yd £0.18	307EP	75Ω "Economy"	yd £0.12		
UR43	50Ω 0·2" Solid	yd £0.17	UR70	75Ω 0·225" Stranded	yd £0.18		
UR76	50Ω 0·2" Stranded	yd £0.17	UR39	75Ω 0·306" Medium	yd £0.27		
UR67	50Ω 0·405" Heavy	yd £0.42	UR57	75Ω 0·405" Heavy	yd £0.48		
RG213	50Ω 0·405" Heavy	yd £0.42	302	75Ω Flat twin	yd £0.11		
306	300Ω Ribbon	yd £0.12	3X21	240Ω Oval twin	yd £0.08		

COAX PLUGS UHF (Post and Packing £0.20) + VAT 15%

PL259	Standard UHF plug	£0.48	SO239	Free angle UR43	£0.88
UG175/U	Reducer UR43	£0.12	PL258	Back-back, female	£0.75
UG176/U	Reducer UR70	£0.12	PL274	Back-back, chassis	£0.93
PL259R	"Reduced" plug	£0.58		Back-back, male	£1.20
PL259SL	"Solderless" UR67	£0.55	M359	Angle (1m + 1f)	£0.93
PL259SS	"Solderless" UR43	£0.55		"T" (3 females)	£1.48
PL259P	Push-on plug	£0.69	M358	"T" (2 fem. 1 male)	£1.20
PL259E	Elbow plug UR43	£0.83		4-way (3 fem. 1 male)	£1.88
	Panel mount PL259	£0.93		SO239/Car + phono	£0.60
SO239F	4 hole socket	£0.42		SO239/2·5mm Jack	£0.69
SO239T	2 hole socket	£0.42		SO239/3·5mm Jack	£0.69
SO239NI	Socket "nut" inside	£0.51	255/U	SO239/BNC male	£1.53
SO239NO	Socket "nut" out	£0.51	273/U	SO239/BNC fem.	£1.53

COAX PLUGS BNC (Post £0.20) + VAT 15%

UG88	Plug, Stnd UR43	£0.54	UG491	Double male	£0.9
UG959	Plug, Large UR67	£2.66	UG274	"T" 2 female, 1 male	£1.4
UG291	Socket, 4 hole stnd.	£0.56		"T" 3 female	£1.7
UG1094	Socket, Nut fixing	£0.56	UG306	Elbow adaptor	£1.6
UG89	Socket, Free, UR43	£0.72	255/U	BNC male/SO239	£1.5
UG914	Double female	£0.93	273/U	BNC female/PL259	£1.5

MASTING (Carriage extra) + VAT 15% (N.B. Max 20', Max BRS 13')

1½" od	Aluminium 16g	ft £0.42	2"	Al. Thick wall 1⅜"	£1.0
1½" od	Aluminium 16g	ft £0.46	2"	Steel Galv. 1⅜"	£0.8

MAST BANDS & PLATES (Carriage £0.40) + VAT 15%

SMP3	3 hole guy plate 2"	£0.85	SMB43	3 hook band
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4mm	HT steel, 1·5T.	yd £0.24	7X18g	Galvanised	100' £4.

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¾"	Bulldog, galv.	£0.16			

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FP301D	Power Supply 20A@ 12V	187.88	145.00
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FR101D	Deluxe Rx 160-10 +2 +4M +BC	603.75	545.00
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RADIO SOCIETY OF GREAT BRITAIN

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Founded 1913
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The national society representing all UK radio amateurs

Membership is open to all those with an active interest in radio experimentation and communication as a hobby. Applications for membership should be made to the general manager, from whom full details of Society services may also be obtained.

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COMPOSITION OF RSGB ZONES

Zone A:	Regions 1, 2 and 18
Zone B:	Regions 3, 4 and 5
Zone C:	Regions 7, 8, 16 and 19
Zone D:	Regions 6, 9, 17 and 20
Zone E:	Regions 10 and 11
Zone F:	Region 15
Zone G:	Regions 12, 13 and 14

COMPOSITION OF RSGB REGIONS

Region 1	Cheshire, Cumbria, Greater Manchester, Isle of Man, Lancashire, Merseyside.
Region 2	All that part of Humberside north of River Humber, North Yorkshire, South Yorkshire, West Yorkshire.
Region 3	Hereford and Worcester, Salop, Staffordshire, Warwickshire, West Midlands.
Region 4	Derbyshire, all that part of Humberside south of River Humber, Leicestershire, Lincolnshire, Nottinghamshire.
Region 5	Bedfordshire, Cambridgeshire, Northamptonshire.
Region 6	Berkshire, Buckinghamshire, Oxfordshire.
Region 7	Greater London south of River Thames, Surrey including that part of London north of the Thames administered by Surrey.
Region 8	Kent, East Sussex, West Sussex.
Region 9	Cornwall, Devon.
Region 10	Dyfed, Gwent, Mid Glamorgan, Powys, South Glamorgan, West Glamorgan.
Region 11	Clwyd, Gwynedd.
Region 12	Grampian, Highland, Island Authorities, Tayside.
Region 13	Borders, Fife, Lothian.
Region 14	Central, Dumfries and Galloway, Strathclyde.
Region 15	Northern Ireland.
Region 16	Essex, Norfolk, Suffolk.
Region 17	Isle of Wight, Channel Islands, Dorset, Hampshire, Wiltshire.
Region 18	Cleveland, Durham, Northumberland, Tyne & Wear.
Region 19	Greater London north of River Thames, Hertfordshire.
Region 20	Avon, Gloucester, Somerset.

A message from the Society's President

In accepting the honour and responsibility of being your 46th President, I would like to take this opportunity to thank all who have given me their loyalty and support.

Freedom of communication should be the radio amateurs' contribution to national and international goodwill: but remember, this freedom carries its responsibility. I therefore hope that 1980 will prove to be a year of "co-operation, not confrontation", to the mutual benefit of all our members whatever their specialized interest or disciplines may be.

May I appeal to all members to *communicate* with their representatives, committees and Council in an endeavour to create a better understanding and appreciation of the varying needs of our membership. Throughout the country, as experienced communicators we have an opportunity to be of service to the community, and I would personally like to thank all who are currently involved with this commitment.

In conclusion I extend my good wishes to all members of the Society for the coming year.

Peter Balestrini, G3BPT

Photo: D. E. Mills, G3LEI

QTC
amateur radio news

Regional representative, Region 14

Mr I. McKechnie, GM8DOX, has resigned the office of regional representative for Region 14 following a change of QTH to outside the region.

Not later than 15 February 1980, any five corporate members resident in Region 14 (Central, Dumfries and Galloway, and Strathclyde) may nominate any other qualified corporate member resident in the region for the office by delivering their nominations in writing, together with the written consent of the nominee to accept office if elected, to the general manager at RSGB headquarters. Each such nominator shall be debarred from nominating any other person for this election.

In the event of more than one person being nominated, a ballot will be conducted, details of which will be published in the April issue of *Radio Communication*.

Regional representative, Region 10

Following the election of Mr R. G. Barrett to Council, the office of regional representative for Region 10 is now vacant.

Not later than 15 February 1980, any five corporate members resident in Region 10 (Dyfed, Gwent, Mid Glamorgan, Powys, South Glamorgan, West Glamorgan) may nominate any other qualified corporate member resident in the region for the office by delivering their nominations in writing, together with the written consent of the nominee to accept office if elected, to the general manager at RSGB headquarters. Each such nominator shall be debarred from nominating any other person for this election.

In the event of more than one person being nominated, a ballot will be conducted, details of which will be published in the April issue of *Radio Communication*.

COUNCIL ELECTION RESULT

The result of the ballot to fill four vacancies on Council from 1 January 1980 was as follows:

ORDINARY MEMBERS

	Votes
D. S. Evans, G3RPE	3,928
K. A. M. Fisher, G3WSN	1,702
G. R. Jessop, G6JP	2,695
J. D. Kay, G3AAE	1,626
R. A. Ledgerton, G2ABC	789
T. I. Lundegard, G3GJW	1,062
D. M. Pratt, G3KEP	2,120

ZONE E MEMBER

R. G. Barrett, GW8HEZ	117
J. Lawrence, GW3YJL	102
Total number of votes accepted	4,575
Late votes not accepted	84
Spoilt votes	37

Messrs **D. S. Evans, G. R. Jessop, D. M. Pratt** and **R. G. Barrett** were accordingly elected to serve on Council for the three years 1980–2.

In addition, Messrs **B. O'Brien, G2AMV; J. Anthony, G3KQF;** and **W. F. McGonigle, GI3GXP,** were returned unopposed as Council members for Zones A, B and F respectively.

The G8-plus-twos

Recently licensed G8-plus-three-letters callsign holders may not be aware that the holders of G8-plus-two-letters callsigns are Class A licensees. Most of these Class A licences were issued in 1936–8.

Special event station callsigns

The Home Office has now given permission for special event stations to use GB4-plus-two-or-three-letters callsigns. These are in addition to the GB2-plus-two-or-three-letters and GB8-plus-two-or-three-letters callsigns already permitted. The GB8 callsigns are primarily for Class B licensees. In future it is intended to leave GB3-plus-two-letters callsigns for repeaters, and GB3-plus-three-letters callsigns for beacons.

Tape, slide and film libraries

A new audio tape and slide library co-ordinator was appointed by Council at its meeting in November. David Simmonds, G3JKB, of 5 The Firs, Wigginton, Tring, Herts, has taken over immediate responsibility for the distribution of RSGB tape and slide lectures. Affiliated clubs, societies and groups may contact G3JKB direct in order to book slides and tapes.

The RSGB video tape and film library is operated by Jack Anthony, G3KQF, whose address is 77 Brayfield Road, Littleover, Derby DE3 6GT.

A list of tapes and films available for loan may be obtained by sending a stamped addressed envelope to the membership services officer at RSGB HQ.

Leicester ARRA Exhibition

The Amateur Radio Retailers' Assoc[illegible]n again held a successful exhibition at Leicester early November, with an estimated 30 per cent increase in the attendance figure compared with last year's exhibition.

The RSGB stand was bigger and better than ever, and book sales were again outstanding. Some 140 new members joined the Society at the stand, and the 1,000th identity card was issued during the three-day event.

Thanks go to members of RSGB staff and volunteers who worked so hard to make the Society's participation a success.

Dag voor de amateur 1979

The annual VERON meeting which took place in Amsterdam on Saturday 27 October was a very special occasion, as it marked the 50th anniversary of amateur radio in the Netherlands. All the events took place in the RAI building which, with its ample facilities, provided room for a large trade display, lectures, films, meetings, and a most interesting demonstration of historical radio equipment.

In the evening a special dinner was provided by VERON for its guests, who were then invited to attend a recording session of one of Holland's favourite radio musical programmes which was made in the main theatre of the RAI complex. The RSGB was officially represented by John Bazley, President, and by David Evans, general manager. The Society's vhf manager, Tom Douglas, and hf manager, John Allaway, also had the privilege of being present.

May RAE

External entries from candidates intending to take the May 1980 Radio Amateurs' Examination can be made during January 1980 at North Wirral College of Technology, Borough Road, Birkenhead, Wirral.

Further details on entry procedure and fees can be obtained from Ian Brooks, G8PMW, examinations officer, at the college, tel 051-652 1521.

Note the date

Saturday 8 March 1980

RSGB National VHF Convention

At the Winning Post and Whitton School
Whitton, Twickenham, Middlesex

Enlarged trade display — Specialist groups' exhibits

Three-stream lecture programme including talks on WARC 79, microprocessors, moonbounce, Amsat UK and microwaves.

Bring and buy sale

Evening social with the Second Foundation modern dance band

Full details next month

Live oil pollution call-out

In the event of oil pollution emergencies, licensed members of Raynet are permitted to provide communication to a shore point from craft up to a seaward limit of two miles. This provision is made under a letter of authorization from the Home Office only at the direct request of an emergency planning officer. The use of /MM callsigns is not required, and operation is only allowed during genuine oil pollution *emergencies* and *NOT* for exercise purposes.

From exercise to live

On 29 October 1979 an excerise was set up at Banff by the emergency planning officer to prove Raynet capability of providing "short-notice" communications. The scheme involved a 144MHz station at control, one 15 miles westwards and local mobiles. The group controller of Grampian Raynet has sent the following report:

"The previous two days had been very stormy, and several large vessels had been seen sheltering in the bays adjacent to Banff. During the morning of 29 October, it was brought to the notice of the oil pollution officer that what was possibly a slick was floating in the bay. A pilot boat was directed to investigate, but as the vhf set on board could only communicate with its base, the officer asked if we could provide a link directly from the boat to the exercise control centre.

"Immediately on receipt of this request, GM8SVB drove to the harbour from which the boat was operating, and embarked with a 144MHz portable set. Contact was established with GM3DZB who was already operational at the exercise control centre. This link was maintained for approximately two hours until the oil pollution officer was satisfied that the slick had either dispersed or had been washed out to sea."

GM8GDN and his members are congratulated on a speedy response to the first oil pollution incident involving Raynet since remit was extended to include "offshore operations".

P. Balestrini, emergency communications manager

QST is on the air

From January 1980 the ARRL magazine *QST* can be air-mailed to Amsterdam and posted in Holland for UK and European subscribers. This will reduce the delivery period experienced with existing sea-mail quite significantly.

New subscribers may take advantage of this service by forwarding a cheque for £20 to RSGB HQ (less 10 per cent to RSGB members). *QST* subscribers renewing existing subscriptions for the air-mail service are asked to wait until their next renewal date. The *QST* air service is only available on a one-year-at-a-time renewal basis.

WARC REPORT

TABLES 1, 2 and 3 contain the basic information concerning frequency allocations as determined by the recent World Administrative Radio Conference. It is not possible in the space of a short initial presentation to present the numerous qualifications that apply to the various allocations. In particular the Table of Frequency Allocations which forms part of the Radio Regulations has become less of a table and somewhat more of a collection of very numerous footnotes. The main result of these footnotes is that allocations above 30MHz are almost invariably shared with other services. This position applies to all services and not only to the amateur service.

It will be noted that IARU Region 1 allocations show alterations and additions at 1·8, 10, 18 and 24MHz, all of them of benefit to the amateur service.

In the case of the 1·8, 18 and 24MHz bands it will be some time before these become available, in order to permit the transfer of services at present operating in the new allocations. For matters other than those involving transfer procedures the operative date of the final acts of the WARC is 1 January 1982.

In a future issue of *Radio Communication*, additional details will be presented, including reference to the various footnotes which affect the amateur service allocations. Because of the many sections in the Radio Regulations which will affect amateur radio, it is intended to produce a booklet which will contain all the relevant items.

Two other items which qualify for mention in this brief initial survey are:

1. The frequency above which administrations may waive the morse code requirement has been lowered from 144 to 30MHz.
2. A proposal to allocate segments of amateur bands for use during natural disasters was replaced by a resolution which recognizes the value of the amateur service for emergency communications.

It is believed that the results of WARC will be considered favourable for the amateur service. These results were based upon a degree of preparatory work never before attempted, followed by conference activity of both the IARU WARC team and radio amateurs present on national delegations. It is hoped that there is sufficient interest in our disappointments and achievements to return to this subject in a future issue.

R. F. Stevens, G2BVN

Table 1. Allocations in IARU Region 1

1,810–1,850kHz	Exclusive, and up to 200kHz (secondary) available by footnote
3,500–3,800kHz	Primary
7,000–7,100kHz	Exclusive (and amateur satellite exclusive)
10,100–10,150kHz	Secondary
14,000–14,350kHz	Exclusive (and amateur satellite 14,000–14,250kHz exclusive)
18,068–18,168kHz	Exclusive (and amateur satellite exclusive)
21,000–21,450kHz	Exclusive (and amateur satellite exclusive)
24,890–24,990kHz	Exclusive (and amateur satellite exclusive)
28,000–29,700kHz	Exclusive (and amateur satellite exclusive)
144–146MHz	Exclusive (and amateur satellite exclusive)
430–440MHz	Primary (amateur satellite 435–438MHz)
1,240–1,300MHz	Secondary. For amateur satellite see Table 2
2,300–2,450MHz	Secondary
3,400–3,475MHz	Footnote
5,650–5,850MHz	Secondary
10–10·5GHz	Secondary
24–24·05GHz	Primary and amateur satellite
24·05–24·25GHz	Secondary
47·0–47·2GHz	Exclusive. For amateur satellite see Table 3
75·5–76GHz	Exclusive
76–81GHz	Secondary
119·98–120·02GHz	Footnote
142–144GHz	Exclusive
144–149GHz	Secondary
241–248GHz	Secondary
248–250GHz	Exclusive

Table 2. New worldwide amateur satellite allocations between 1,200MHz and 10·5GHz

1,260–1,270MHz	Earth to space, or uplink, only
2,400–2,450MHz	
3,400–3,410MHz	Regions 2 and 3 only
5,650–5,670MHz	Earth to space, or uplink, only
5,830–5,850MHz	Space to earth, or downlink, only
10·45–10·5GHz	

Use of these frequencies is on the basis of non-interference to other services.

Table 3. New worldwide amateur satellite allocations above 40GHz

47·0–47·2GHz	Exclusive
75·5–76·0GHz	Exclusive
76–81GHz	Secondary
142–144GHz	Exclusive
144–149GHz	Secondary
241–248GHz	Secondary
248–250GHz	Exclusive

ARRL has also announced two- and three-year subscription rates, and these can now be handled by the RSGB in addition to the one-year subscription either for new or renewing *QST* subscribers. The rates are £22.60 for two years and £32.85 for three years. (Both prices less 10 per cent to RSGB members). All *QST* subscriptions should be addressed to RSGB marked "Publications—sales".

"SWL news"

The editor regrets that this issue does not include "SWL news" as a result of the late arrival of Bob Treacher's copy.

Stolen equipment

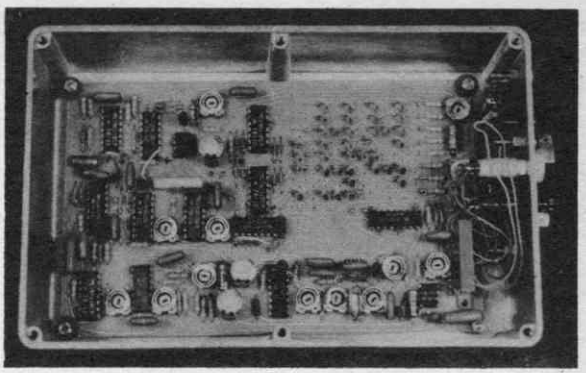
On 10 November, during a smash-and-grab raid on the shop of D. P. Hobbs Ltd, Luton: Lowe SRX30 receiver; Yaesu FRG7 receiver, serial number 288M 241674; KDK FM2016E 144MHz transceiver, serial number E1470; Microwave Modules MMT432/285 transverter, serial number 1368; secondhand Trio QR666 receiver, serial number 230178. Any information to D. P. Hobbs Ltd, 11 King Street, Luton LU1 2DW.

In early November from a car in Hastings: Trio TR2200 serial number 351125. Modifications include: panel light on ext

(Continued on page 46)

A basic repeater logic system (the GB3US Mk 1)

by A. J. T. WHITAKER, G3RKL*



The unit installed in a die-cast box

Introduction

At the present time proposals are on file for well over 100 UK repeaters, all of which will need some kind of control logic. Most of these proposals are for single-channel phone repeaters on 144 and 432MHz, using 25kHz channelling fm. In the past, when the station hardware was far more of an experimental challenge than it usually is nowadays, a group would have at least one logic "whiz-kid" who could design, build and maintain the required control system. However, with an extensive UK repeater network now established this is not always the case and there seems to be a definite requirement for a control system that is simple to understand, build, maintain and use.

The unit described here is all of these, and was designed to act either as a secondary (standby) logic for a more sophisticated primary control, eg at GB3HH, or as a primary control in its own right on a less "demanding" repeater, eg GB3US on 432MHz. It is also cheap, around £20 for easily obtainable components, and can be built and made to work by anyone with reasonable constructional skill in a couple of evenings.

Operation

The operational performance of the unit is summarized below:

1. Tone access, carrier maintained (no time-out).
2. MCW callsign identification at 1,750Hz† every 5min†; at high deviation† when not in use, at low deviation† otherwise.
3. Eight seconds†, double-pip indication of input clear (psuedo forbidden gap and reaccess period).
4. Optional callsign at the end of the pip-tone sequence.
5. 20dB† through audio mute on toneburst detection.
6. Selectable squelch control, logical or relay.
7. Low impedance audio output up to several volts peak to peak. Transmit key output will drive a small low-voltage relay.
8. Remote closedown, eg an externally located key switch, prevents the transmitter from being keyed but leaves the rest of the station unaltered.
9. Low power consumption (cmos logic devices), +13·5V, ±1·5V at approximately 40mA.
10. Small size, one double-sided pcb 6·5 by 4in. It will fit inside a 7·25 by 4·5in die-cast box, as shown in the photograph.

The unit meets the current UK repeater licence requirements, and is sufficiently flexible, with the adjustable parameters, to give the repeater its own individual sound.

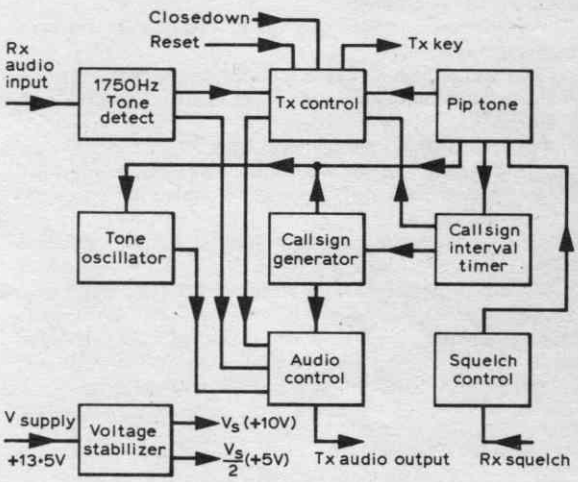


Fig 1. Block diagram of the system

Circuit description and operation

Fig 1 shows the nine main circuit building blocks with their general interconnection, and Fig 2 is the detailed circuit diagram. On receipt of a valid access tone, the NE567 pll tone detector output (pin 8, IC13) will go low, setting flip-flop IC1a,b into relay mode via inverter IC7d, and simultaneously muting the through audio by removing the short-circuit (switch IC11b) across RV8. Flip-flop IC1a,b also switches on the

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† Indicates adjustable parameter.

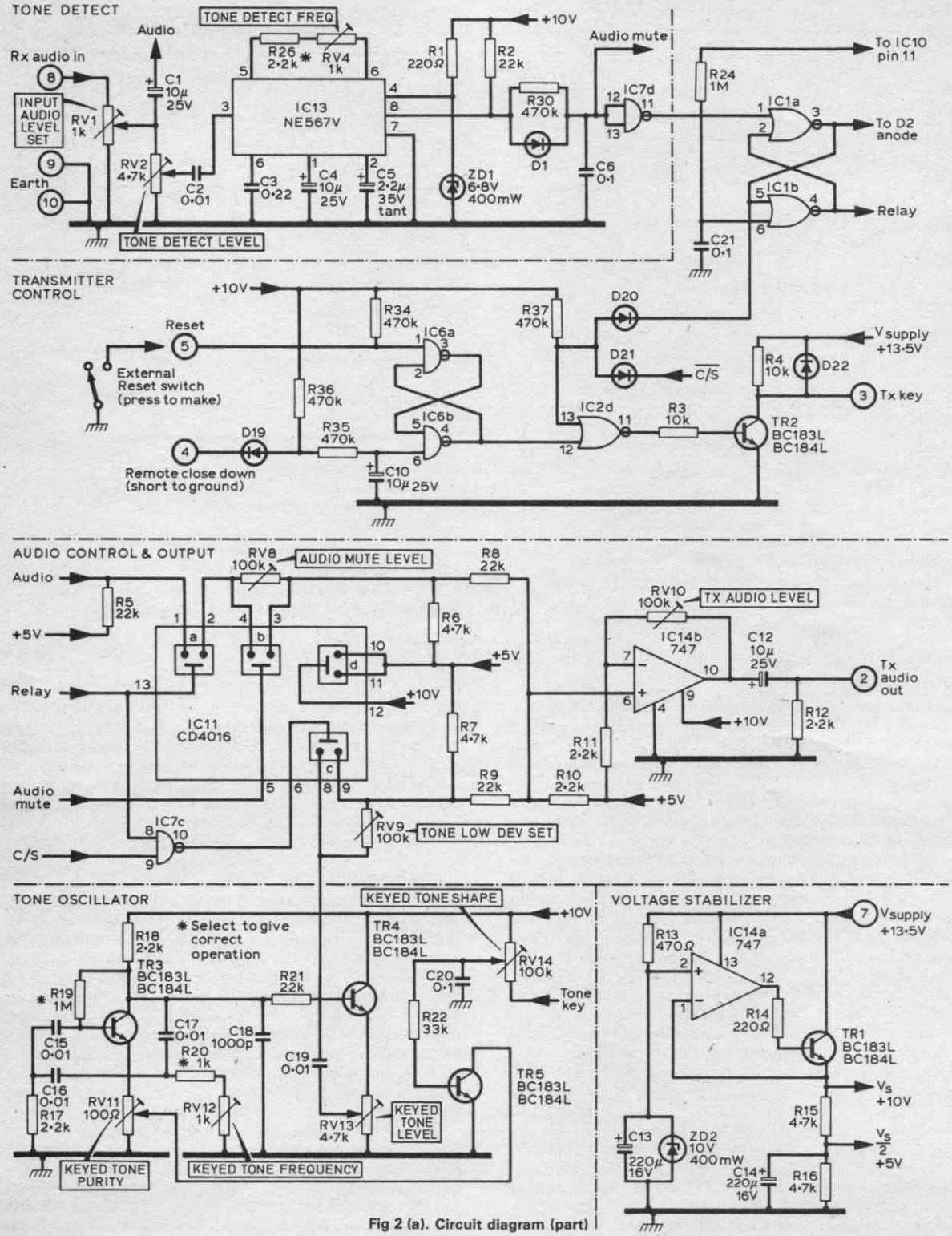

Fig 2 (a). Circuit diagram (part)

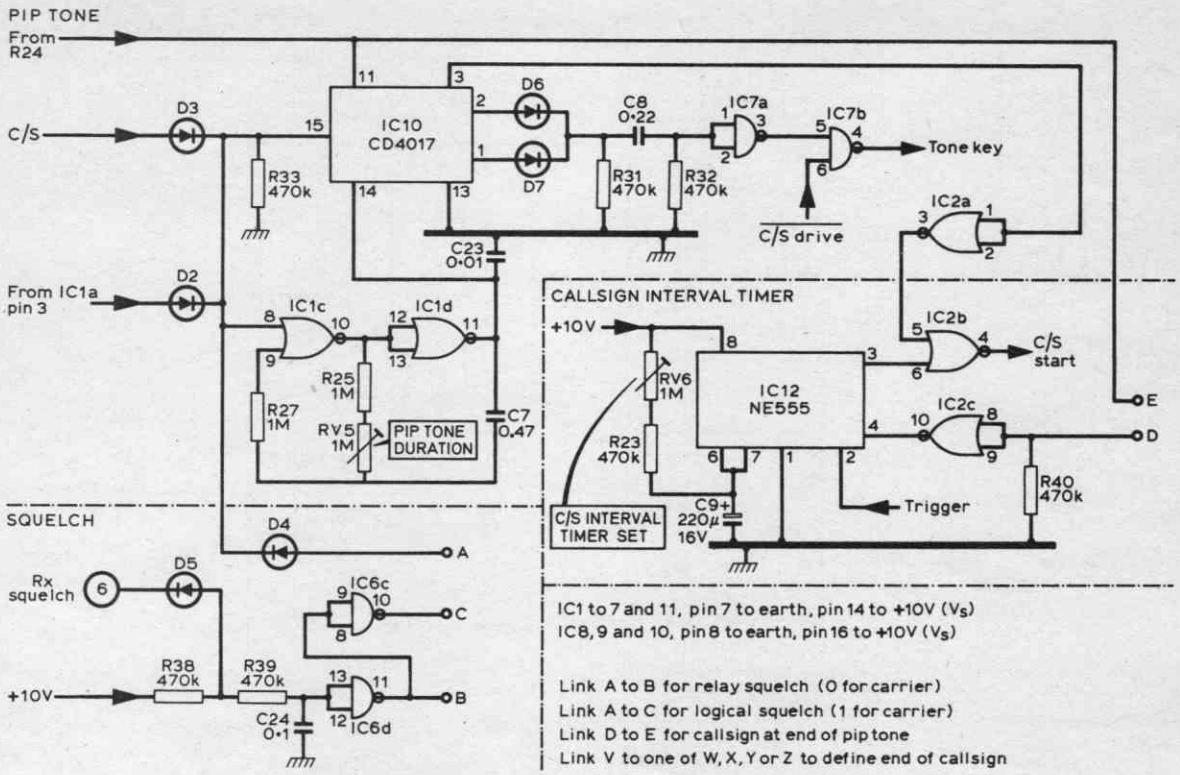

Fig 2 (b). Circuit diagram (part)

transmitter via D20, IC2d and TR2, and enables the through audio via IC11a. The internal squelch signal required at pin A is a logical one for carrier present, and this is selected by linking A to either B or C depending on the squelch output of the receiver in use. When the input signal goes off, SQUELCH goes low, enabling the multivibrator IC1c,d and counter IC10 of PIP TONE; if the callsign is being sent it would maintain a hold via D3 until completed.

Two pulses are generated via D6 and D7 and the one shot C8, R32 and IC7a, which are routed to the TONE OSCILLATOR via IC7b. If a signal appears on the input during this time, PIP TONE is immediately reset and held via D4. If not, it resets IC1a,b at the end of the sequence (count 9, pin 11 of IC10), which switches off the transmitter, unless link DE is in place. In this case the NE555 CALLSIGN INTERVAL TIMER is reset via IC2c, initiating the CALLSIGN GENERATOR via IC2b, and switching on the transmitter via D21, tone keying at high deviation via IC7c and IC11c. The callsign generator is a conventional circuit, with 80 bits (10×8) available, which should accommodate most callsigns, diodes being inserted where a bit is to be keyed. The CALLSIGN INTERVAL TIMER will also initiate the CALLSIGN GENERATOR at the preset interval, tone keying at high deviation as above when not in use, otherwise at low deviation (by removing the short-circuit IC11c across RV7).

The tone oscillator is a simple RC ladder circuit, with an emitter follower buffer TR4, switched by TR5 to give a very reasonable keying characteristic. The through audio and tone are mixed in IC14b, which gives a low impedance output of up to several volts peak to peak. The other half of the 747, IC14a, is used as a simple voltage stabilizer to supply the whole of the circuit. If the remote closedown is activated, flip-flop IC6a,b is set, which inhibits IC2d and prevents TR2 from switching on the transmitter until IC6a,b is reset. This reset switch should be located *only* at the station itself, ie *not* remotely.

Construction

The construction is straightforward and no real difficulties should be encountered, Fig 3 showing the component layout. With some makes of preset resistors, the underside of the wiper will need trimming to avoid snagging adjacent components, and this should be checked before soldering. The suggested order of mounting is: through-board pins; Veroboard pins (at lettered link connections); resistors; diodes; capacitors; transistors; callsign matrix (Fig 4); connector; and ics, with IC9 first to make soldering the top easier. Make sure that pins 9 and 13 of IC14 (747) are *not* internally connected; observe due caution when handling the cmos devices, and check that all the top and bottom connections are properly soldered.

The 10-way connector is not essential but does make the board interface more convenient. To prevent rf getting to the board, external connections may need to be made via a combination of leadthrough capacitors, chokes, ferrite beads and decoupling capacitors, although at GB3US and GB3HH this was found to be unnecessary. Two links are required, one

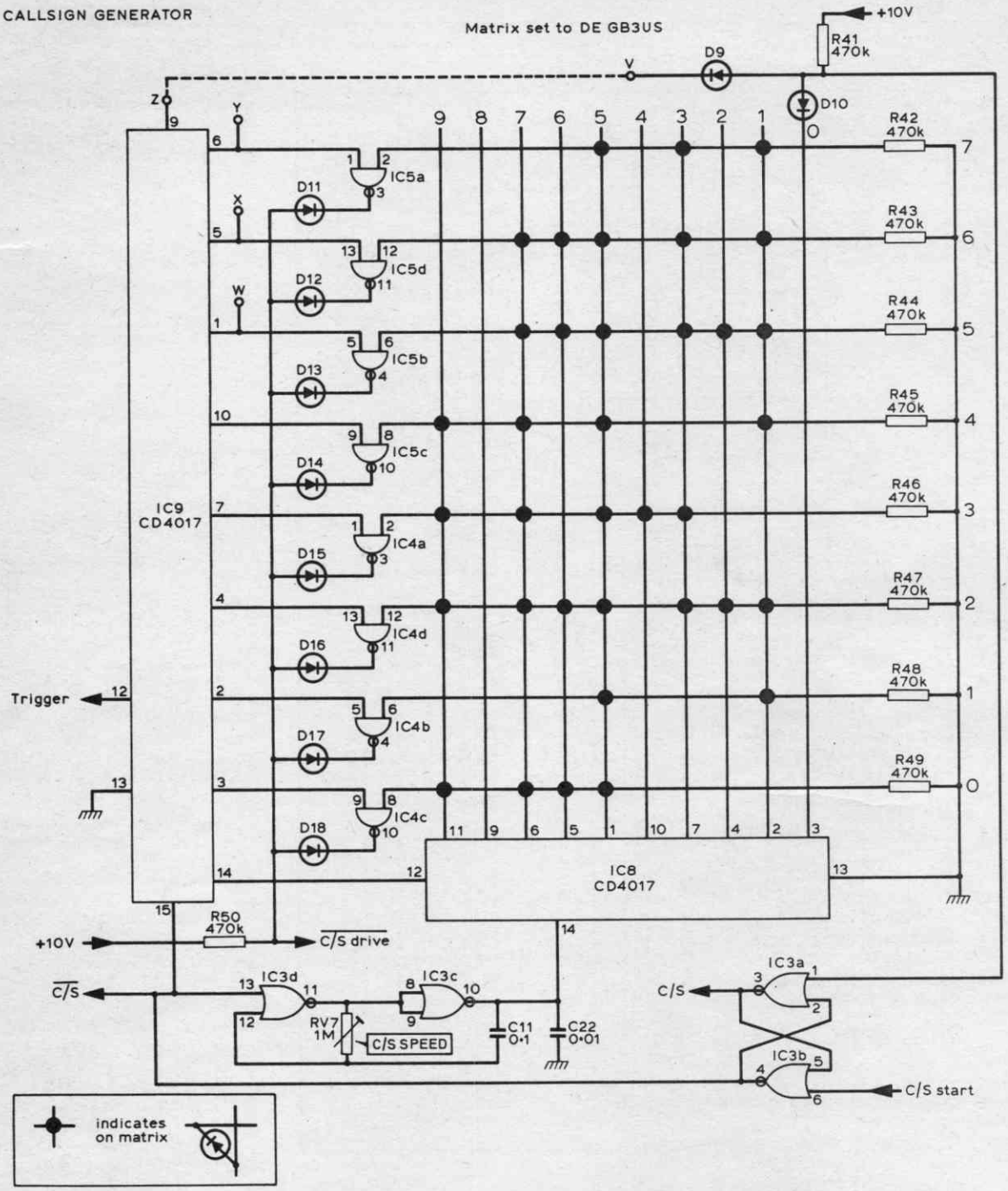

Fig 2 (c). Circuit diagram (part)

Components list

R1, 14	220Ω
R2, 5, 8, 9, 21	22kΩ
R3, 4	10kΩ
R6, 7, 15, 16	4·7kΩ
R10, 11, 12, 17, 18, 26*	2·2kΩ
R13	470Ω
R19*, 24, 25, 27	1MΩ
R20*	1kΩ
R22	33kΩ
R23, 30–50	470kΩ

All resistors 0·25W 5% high stab carbon film

RV1, 4, 12	1kΩ	miniature horizontal presets
RV2, 13	4·7kΩ	
RV5, 6, 7	1MΩ	
RV8, 9, 10, 14	100kΩ	
RV11	100Ω	
C1, 4, 10, 12	10μF, 25V, tubular	
C2, 15, 16, 17, 19, 22, 23	0·01μF, 250V, mini polyester	
C3, 8	0·22μF 250V, mini polyester	
C5	2·2μF, 35V, tantalum	
C6, 11, 20, 21, 24, 3 off CD	0·1μF, 250V, mini polyester	
C7	0·47μF, 250V, mini polyester	
C9, 13, 14	220μF, 16V, single-ended pc	

C18	1,000pF, 160V, polystyrene
TR1–5	BC183L or BC184L
ZD1	6V8, 400mW
ZD2	10V, 400mW
Diodes	General purpose silicon diodes, eg 1N914, 1N4148
IC1, 2, 3	CD4001 AE or BE
IC4, 5, 6, 7	CD4011 AE or BE
IC8, 9, 10	CD4017 AE or BE
IC11	CD4016 AE or BE
IC12	NE555V
IC13	NE567V
IC14†	747
Connector	RS printed circuit connector (488-359)

* Component value selected to give correct operation.
† See text.

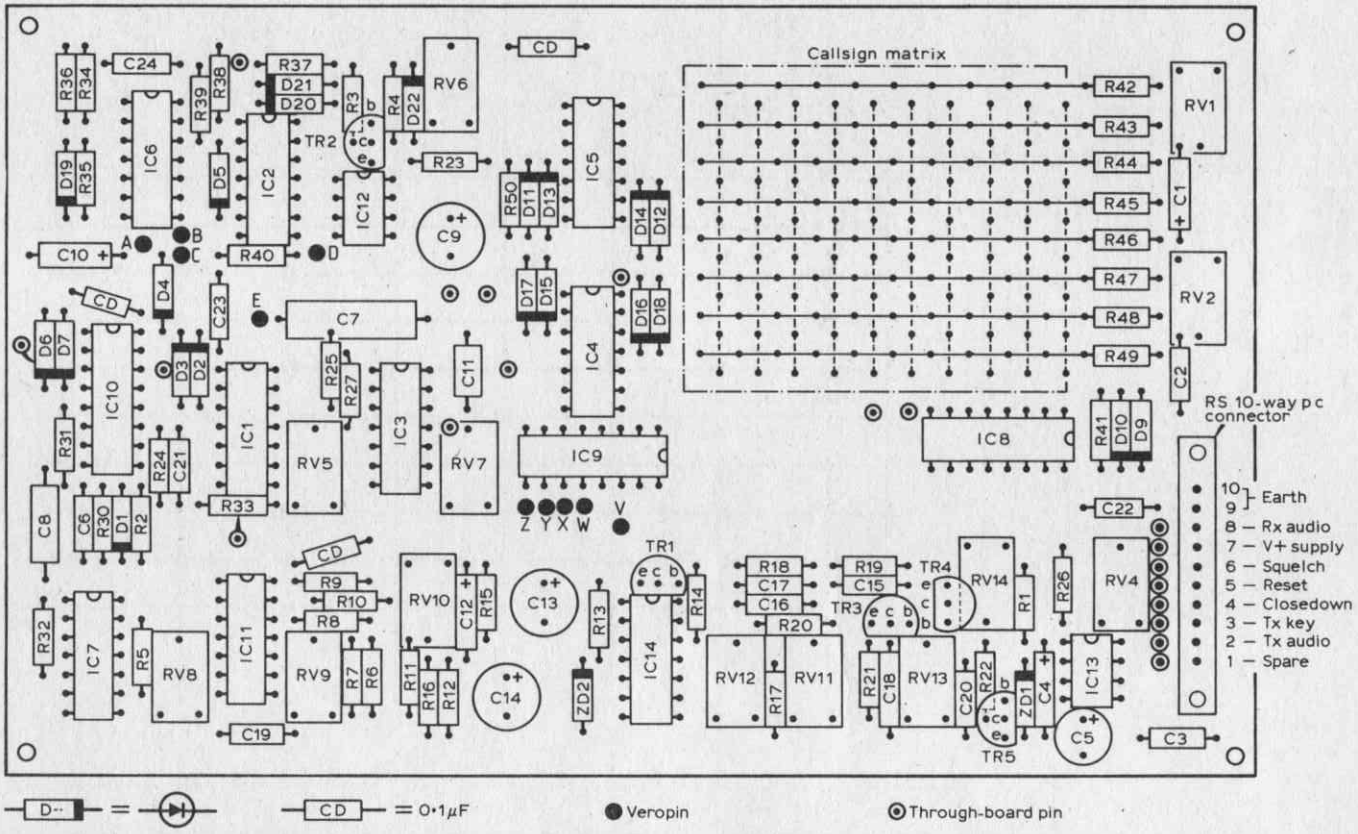

Fig 3. Component layout

from A to either B or C to select the type of receiver squelch in use, and the other from V to one of W to Z to define the end of the callsign. If the optional callsign at the end of the pip-tone is wanted, DE should also be linked.

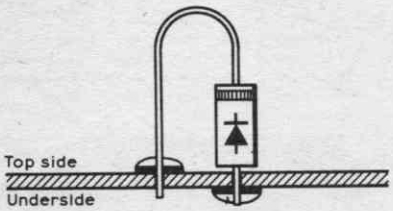

Fig 4. Callsign matrix diode position

Setting up

The only test instruments required are a multimeter, an oscilloscope—preferably dual trace, and an audio oscillator and frequency meter if the oscillator is not accurately calibrated.

1. Set all presets counter-clockwise, except RV7, RV11 and RV14, which should be set fully clockwise. Jumper R23 with a 1kΩ resistor, and set the squelch input to simulate a carrier present.
2. Apply +13·5V (current should be ≃40mA), check $V_s = 10V$ and $V_s/2 = 5V$.
3. With the 'scope, test at the ungrounded end of RV13, where the tone oscillator should be giving a distorted waveform. If not, reduce the value of R19 until it oscillates, although this should not require less than 470kΩ. Adjust RV11 for a good sine wave of around 6V peak to peak, and RV12 for the desired frequency (1,750Hz), changing R20 if necessary—these two presets are mutually interactive. Turn RV14 fully counter-clockwise, and the callsign should now be keyed very slowly. Adjust RV14 carefully for the best keying waveform (about quarter-way clockwise). Readjust RV11, RV12 and RV14 for the best keyed sine wave on the desired frequency.
4. With the 'scope, testing at R26, set RV4 for a 1,750Hz waveform from the NE567, changing R26 if necessary.
5. Inject a 1,750Hz sine wave into the RX AUDIO IN, at approximately 2V peak to peak. Adjust RV1 to give 1V p–p at the junction of RV2 and C1. (In actual operation RV1 is adjusted to give 1V p–p receive audio signal at this point from a 5kHz deviated signal.) Advance RV2 and the 567 should lock. Adjust RV2 to give ≃ ±40Hz lock signal in relation to 1,750Hz. Too high a level will make it trip on speech, too low a level will make access difficult.
6. With the 'scope, testing at TX AUDIO OUTPUT, set RV10 for a convenient level; say, 1V p–p. Advance RV8 (with the

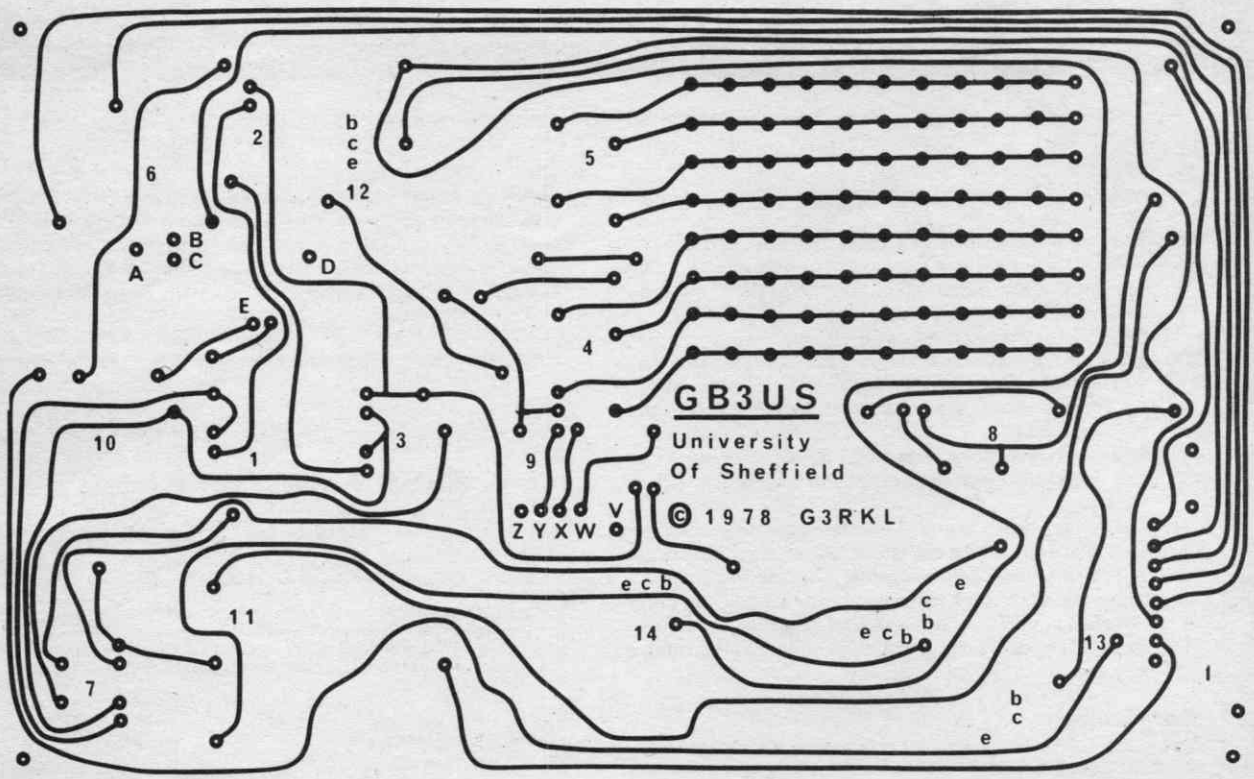

Fig 5. PCB, component mounting side

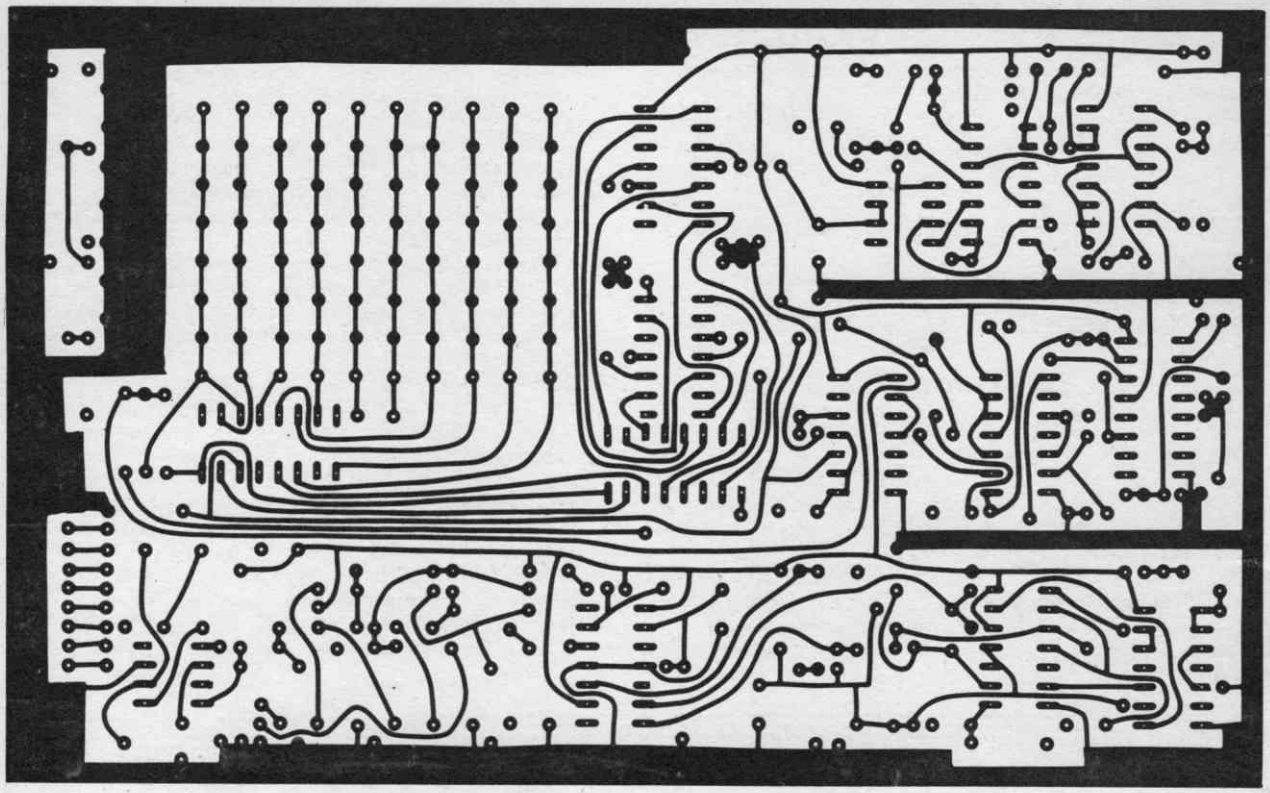

Fig 6. PCB underside (when reversed through 180°)

567 still locked) to check the muting, and set, say, 20dB down.

7. Remove the 1,750Hz signal from the input, and advance RV13 to give the same level at the output from the tone oscillator (high deviation level). Set RV9 to give the desired reduction for low deviation; say, 10dB.
8. Set RV7 for desired callsign speed.
9. Set RV6 fully clockwise (to stop the callsign repeating). Operate the squelch input and set RV5 for the desired pip-tone length. Note, a toneburst will be needed to "open up" each time.
10. Remove power, remove the 1kΩ across R23, power-up and set RV6 to give the desired interval callsign period (5min).
11. Check that the transmit key, closedown and reset are working. Because of the circuit parameters, closedown will take about 5s to operate, to prevent spurious triggering, and, when powered-up, the unit will be in the closedown condition, ie it will need resetting.
12. Readjust, as above, to give the final desired performance with the equipment to be used.

Conclusion

Two units have been in use for some time at GB3US (primary control) and GB3HH (secondary control) and have given reliable, trouble-free operation, with favourable comments from the repeater users. For the repeater group this basic logic system is simple, cheap, quick to build and very easy to understand in operation. As such it is eminently suitable as a back-up for an existing (or projected) primary control, although, with the current trend towards simplicity, it makes an excellent primary control itself, especially on 432MHz. □

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Oscar 7 between sunlight and the earth's shadow

by J. RADDATZ, DL3ZK*; translated by DL1XJ

Introduction

Telemetry data received from Oscar 7 during the past few years indicated an increase in temperature during the northern winter when the satellite was passing over the northern hemisphere. This high temperature was accompanied by a growing number of faults in the satellite's electronic system, e.g. frequent switch-over from one mode to another, malfunction and complete breakdown of the telemetry section and of the transmitter etc. During the northern summer operation returned to normal.

When the possible causes of the trouble were investigated it was soon surmised that the disturbances might have been caused by increased irradiation by the sun; prolonged exposure to the sun's rays leading to an increased intake of heat by the satellite. Under ideal conditions a satellite in space will expend the same amount of heat which it has previously absorbed, but this process is influenced by the shape of the satellite, details of its construction and of its surface. Hence, it is possible that in certain structural parts of the satellite an accumulation of heat will occur which may lead to trouble, particularly as far as semiconductors are concerned.

If the supposition as regards the cause of the disturbances is correct, it remains to be proved that Oscar 7 passed through sunlight during the periods when the troubles occurred. This article is intended as a contribution to clear up this problem.

Current by solar cells as a light indicator

To determine whether Oscar 7 is travelling through a sunlit area it is only necessary to listen to the telemetry beacon signal. When lit by the sun the four quadrants of the solar cells each supply a separate current to the storage battery, the magnitude of which is indicated in the telemetry data. In morse code telemetry the respective channels are channels 1B, 1C, 1D and 2A. If the satellite is passing through the earth's shadow, "no current" is signalled in these four channels.

For more than two years the existence of solar cell current was invariably indicated over Europe, and at no time during this period was the "no-current" state signalled. Consequently Oscar 7 must have been passing constantly through sun-lit space when flying over Europe, irrespective of day-time or night-time on the earth's surface. This conclusion proved to be perfectly correct, as is subsequently confirmed mathematically.

Satellite orbit and season

Fig 1 shows a simplified plot of the position of the Oscar 7 orbit in relation to the earth's shadow in winter and in summer. During the northern winter, when the sun is at its maximum declination south of the equator (negative sun declination), the satellite does not even touch the earth's shadow during a complete orbit from equator crossing to equator crossing, and is constantly flying in full sunlight, irrespective of prevailing day-time or night-time conditions at the location of the observer. The observer rotates with the earth beneath the seemingly "stationary" orbit line of the satellite; hence his day/night relation to the sun is entirely different from that of the satellite.

*Himmershoi 12, D-2391 Wees, W Germany.

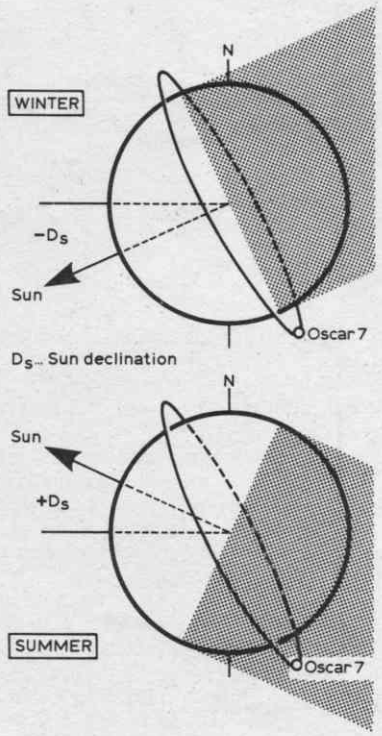


Fig 1. Simplified plot of the configuration of the earth's shadow and the orbit of Oscar 7

For certain periods during the summer (positive sun declination) Oscar 7 passes through the earth's shadow and its temperature falls.

It is, of course, possible to compute beforehand when and where the satellite enters and leaves the earth's shadow during each orbit, but the calculations will not be given here. It is, however, interesting to note that in the year 1979 all transitions into the earth's shadow occurred over the southern hemisphere, with a maximum at about 40°S.

Calculation of the shadow height

When the question is restricted to whether in the course of a year (or on a certain day) the satellite touches the earth's shadow or not, the computations become much more simple, particularly if a circular orbit is assumed; for Oscar 7 a circular orbit having a median height of 1,460km can be assumed.

The problem to be solved is to find the height of the earth's shadow above the earth's surface in the satellite's orbital plane. When the border-line of the shadow zone is lower than the orbital height, Oscar 7 remains above the shadow zone and is exposed to the sunlight. If, on the other hand, the shadow zone extends to a region above the orbital height, Oscar 7 must naturally pass through the shadow. From [1]:

$$H = \frac{R}{\sin D_s \cos i - \cos D_s \sin i \sin (L_s - \Omega)} - R \qquad (1)$$

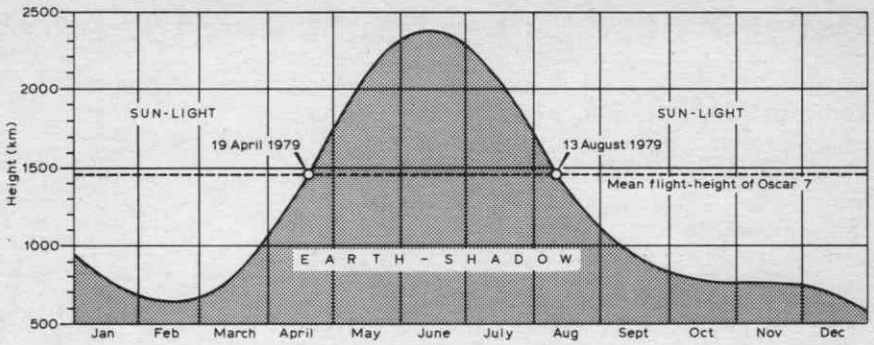


Fig 2. Height of the earth's shadow above its surface in the orbital plane of Oscar 7 during 1979

where H = height of the earth's shadow in the orbital plane in kilometres
R = median earth radius (6,371 km)
i = inclination (Oscar 7 at time of writing 101·5°/summer 1979) in degrees
Ω = rectascension of the satellite in degrees
D_s = declination of the sun (see Table 1) in degrees
L_s = ecliptical longitude of the sun in degrees

Completely unknown terms in this equation should not deter the radio amateur as it will be shown below how this problem can be solved by quite simple means.

Fig 2 shows a shadow curve of Oscar 7 plotted from equation (1) for the year 1979. It shows that after a "prolonged sunny winter" the satellite eventually reached the earth's shadow again on 19 April 1979. In the period between 19 April and 13 August 1979 the satellite passed once on each orbit through the earth's shadow (over the southern hemisphere), and will subsequently be flying in sunlight until summer 1980—with anticipated disturbances. The "shadow mountain" prevailing during the summer over the median orbital height of Oscar 7 (Fig 2) will become smaller and smaller from year to year. During 1980 it will still surmount the orbital height of the satellite, while for 1981 this is becoming doubtful owing to the satellite's orbital height and shadow height becoming more or less equal. From 1983 onwards Oscar 7 will remain in sunlight for an extended period of time, exactly as its predecessor Oscar 6 did before its electronic system broke down completely.

The solar time angle Ω_s

The calculation of the shadow height in the orbital plane, equation (1), presents some difficulties to the radio amateur since it requires the knowledge of certain data of the satellite and the sun orbits which are not readily available. The sun's coordinates can be obtained from astronomical year-books or taken from other tables of ephemerides but to get the rectascension data of the satellite is more difficult as official measurements are hard to come by. Although it is quite feasible to obtain accurate values of rectascension by radio observations this procedure is rather time-consuming and cannot be recommended to the inexperienced.

A way out of this quandary is offered by the term "solar time angle" (Ω_s) which was introduced by the author and which can easily be determined. For this purpose only a list of equator crossings (eqx), as accurate as possible, is needed. Such lists are universally in use by radio amateurs. The solar time angle Ω_s is the angle between the ascending node (eqx) and the midnight meridian (shadow middle-line, Fig 3). The numerical value of the solar time angle is obtained by dividing the utc (time of the eqx) expressed in minutes by four and subtracting the result from the geographical longitude (west) of the respective eqx.

Example: Oscar 7, 22 January 1979

Orbit	UTC	Degrees W	
19,147	0112·2	79·2	(according to W6PAJ)

1h 12·2min = 72·2min: 4min/° = 18·05°
79·2° − 18·05° = 61·15°

The solar time angle Ω_s of Oscar 7 amounted to 61·15° on 22 January 1979. It remained constant for all orbits.

The time equation

The rotation of the earth around its axis (diurnal rotation) is relative with respect to the fixed star sky, and its angular velocity is practically constant. This forms the basis of our measurement of time. In contrast, the annual revolution of the earth around the sun is not regular. The angular velocity varies because the orbit of the earth around the sun is not circular but somewhat elliptical, and to follow the sun exactly over one year, a clock should, at times, run faster or slower than normal.

Conventional clocks, however, are designed to run at uniform speed, and to allow for this the concept of a theoretical sun which exhibits constant angular velocity was "invented". This is the so-called "median sun", to which the median local time is referred. Hence one should differentiate between the two concepts of median sun and the true sun,

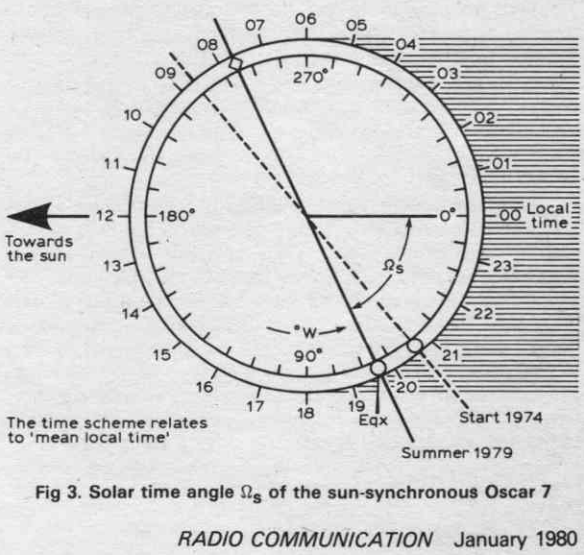


Fig 3. Solar time angle Ω_s of the sun-synchronous Oscar 7

which differ from each other by a small angular and time difference; this difference is called time equation.

Since the shadow of the earth is produced by the true sun, and the utc time is referred to the median sun, the time equation must be taken into account when calculating the shadow zone. Table 1 contains the time equation in degrees for 1979. The values change a little from year to year.

Solar time angle and calculation of the shadow zone

The term $(L_s - \Omega)$ in equation (1) can be conveniently substituted by the readily available solar time angle and the time equation. By inserting $L_s - \Omega = \Omega_s + 180° - \Delta_t$, equation (1) reads:

$$H = \frac{R}{\sin D_s \cos i - \cos D_s \sin i \sin (\Omega_s + 180° - \Delta_t)} - R \quad (1a)$$

(Δ_t = time equation)

The only remaining unknown quantity is the declination of the sun, D_s. This quantity is also listed in Table 1 for the year 1979. Without incurring too great an error these values hold also for other years.

Finally, as an example, the height of the earth's shadow in the orbital plane of Oscar 7 for orbit No 19,147 on 22 January 1979 is computed.

Setting		
	$\Omega_s = 61 \cdot 15°$	(see earlier example)
	$\Delta_t = -2 \cdot 84°$	(Table 1)
	$D_s = -19 \cdot 86°$	(Table 1)
	$i = 101 \cdot 50°$	

which gives:

$(\Omega_s + 180° - \Delta_t) = 61 \cdot 15° + 180° - (-2 \cdot 84°) = 243 \cdot 99°$, and

$$H = \frac{6371}{\sin(-19 \cdot 86°) \cos 101 \cdot 5° - \cos(-19 \cdot 86°) \sin 101 \cdot 5° \sin 243 \cdot 99°} - 6371$$

$= 739 \cdot 3$km

Hence, the upper contour of the shadow area is markedly beneath the medium flight height of Oscar 7 and the satellite travelled in sunlight during the entire orbit.

Some readers may be interested to learn that in the example computation of orbit No 19,147, the eliptical longitude of the sun L_s was 303·59° and the rectascension of the satellite was 59·60°.

Oscar 7 crossing the equator

Oscar 7 became operational on 15 November 1974, and countless amateurs all over the world have used it to establish radio contacts at all times of the day and night. However, a certain phenomenon has passed virtually unnoticed: only a few seem to be aware that throughout its more than 20,000 orbits the satellite has never actually "seen" the landscape at the equator when crossing it in the ascending (south-north) direction!

This is not astonishing, because the equator was always in the earth's shadow when the satellite was travelling in the S–N direction. The reason is the sun-synchronous type of orbit of Oscar 7. When crossing the equator in the S–N direction (ascending node eqx) the satellite always has the same angular distance (solar time angle = local time difference) to the sun and, hence, to the shadow mid-line (midnight meridian = midnight local time). Sun-synchronous satellites cross the equator always at the same local time, since the local time is directly related to the sun, and the sun-synchronous satellite proper is also in fixed relation to the sun by means of the fixed solar time

Table 1. Sun declination D_s and time equation on an angular scale for every Monday 0000 hours utc of the year 1979

Date 1979	Sun declination (degrees)	Time equation (degrees)	Date 1979	Sun declination (degrees)	Time equation (degrees)
1.1	−23·06	−0·79	2. 7	+23·10	−0·94
8.1	−22·34	−1·59	9. 7	+22·45	−1·25
15.1	−21·27	−2·28	16. 7	+21·50	−1·47
22.1	−19·86	−2·84	23. 7	+20·24	−1·59
29.1	−18·14	−3·25	30. 7	+18·71	−1·60
5.2	−16·16	−3·49	6. 8	+16·92	−1·49
12.2	−13·96	−3·57	13. 8	+14·92	−1·24
19.2	−11·56	−3·49	20. 8	+12·72	−0·89
26.2	− 9·02	−3·27	27. 8	+10·35	−0·44
5.3	− 6·36	−2·94	3. 9	+ 7·85	+0·08
12.3	− 3·64	−2·51	10. 9	+ 5·25	+0·67
19.3	− 0·88	−2·02	17. 9	+ 2·57	+1·29
26.3	+ 1·88	−1·50	24. 9	− 0·14	+1·91
2.4	+ 4·61	−0·97	1.10	− 2·87	+2·50
9.4	+ 7·27	−0·47	8.10	− 5·57	+3·04
16.4	+ 9·83	−0·01	15.10	− 8·21	+3·49
23.4	+12·26	+0·37	22.10	−10·76	+3·84
30.4	+14·52	+0·67	29.10	−13·18	+4·04
7.5	+16·58	+0·85	5.11	−15·43	+4·10
14.5	+18·43	+0·93	12.11	−17·47	+3·99
21.5	+20·01	+0·88	19.11	−19·27	+3·70
28.5	+21·32	+0·73	26.11	−20·78	+3·24
4.6	+22·33	+0·48	3.12	−21·98	+2·64
11.6	+23·02	+0·16	10.12	−22·83	+1·91
18.6	+23·38	−0·20	17.12	−23·32	+1·09
25.6	+23·41	−0·58	24.12	−23·43	+0·22
			31.12	−23·15	−0·64

(Data by courtesy of Deutsches Hydrographisches Institut Hamburg)

angle. This is the basic characteristic of all sun-synchronous satellites.

Problem: At what local time (always the same) does Oscar 7 cross the equator in S–N direction?

As an example, 22 January 1979 is chosen and from the eqx-list for Oscar 7 edited by W6PAJ we find for this date:

Orbit No	UTC h. min	Degrees west	Solar time angle Ω_s
19,147	1.12·2	79·2	61·15°
19,148	3.07·1	107·9	61·125
19,149	5.02·1	136·7	61·175
19,150	6.57·0	165·4	61·15
19,151	8.51·9	194·1	61·125
19,152	10.46·9	222·9	61·175
19,153	12.41·8	251·6	61·15
19,154	14.36·8	280·3	61·10
19,155	16.31·7	309·1	61·175
19,156	18.26·7	337·8	61·125
19,157	20.21·7	6·6	61·175
19,158	22.16·6	35·3	61·15

The solar time angle listed in the last column was calculated according to the method earlier; as was to be expected, this angle is constant and amounts to 61·1°.

A solar angle of 61·1° means that the equator crossing took place at a point 61·1° from the midnight meridian (midnight local time), and 61·1 angular degrees are equivalent to 244·4 time minutes, ie 4h and 4·4min, and it was exactly this time difference in relation to midnight local time at which all S–N crossings took place.

2400 local time − 4h 4·4min = 1955·6 local time. All S–N equator crossings of Oscar 7 on that date, as well as on the preceding and following days, were at 1955·6 local time, but always at a different location (point Y) on the equator.

At 1955·6 local time all locations on the equator are in the earth's shadow, since the sun sets at the equator around 1800 local time throughout the year. The accurate times, dependent on the time equation, lie between 1747 and 1818 mean local time and the dusk lasts about 22min. At 1955·6 local time the surface of the earth is already completely in darkness when

(Continued on page 46)

EQUIPMENT REVIEW

The "Oscarbox"

by PAT GOWEN, G3IOR*

Front panel of the Oscarbox showing S-meter, af and rf gain controls, normal and inverted sideband selector switch, peak (clarify) control, main tuning dial and bandspread, and led-indicated band selector switch

Equipment limitations can impose restrictions upon those who might otherwise wish to work dx via the Oscar satellites due to a number of factors; for example, the need for a separate receiver, and even, if available, the poor performance at the high end of 29MHz (if indeed the device has coverage of the high end of the band), and, not the least reason, the sheer economic feasibility of buying a piece of expensive equipment that covers functions and frequencies not normally of interest to the vhf enthusiast.

The hf enthusiast with a minor interest in vhf might well be employing his transceiver on the 29MHz band for use with a transverter to give him access to the 144MHz band, again causing considerable extra expenditure for either a separate vhf transceiver or an equally costly additional hf receiver. In either case, the portable and mobile function of an effective station with Oscar facilities becomes demanding in terms of weight, power, sheer volume and cost.

With such situations in mind, and to give the opportunity of satellite usage to those parts of the world where operation is rare due to the difficulties of obtaining suitable sophisticated equipment, Tony Bailey, G3WPO, has come up with the answer in the form of the "Oscarbox".

Fundamentally it consists of a full kit to build a superb tunable ssb and cw single-conversion receiver covering from 3·5–4MHz, with 2·1 or 4kHz bandwidth mechanical filter (the 2·1kHz version was supplied for this review), varicap diode tuning, switchable sidebands, an excellent af-derived alc system with S-meter, active af filter with adjustable bandwidth, built-in voltage regulation, and other optimized modern state-of-the-art circuitry. It only requires 11–14V dc, a loudspeaker and an antenna as outboards, and needs only a soldering iron to build on the fully-drilled glass-fibre pcb from all the components provided.

To cover Oscar use, a 29MHz converter module, crystal controlled to the basic tunable i.f. is added as a further kit, producing one of the best receivers the reviewer has ever encountered for the 29·4–29·5MHz Mode A satellite downlink band. Further to this, a 145MHz converter can be added, feeding the 29MHz converter module, to give the 145·8–146MHz Mode B Oscar band.

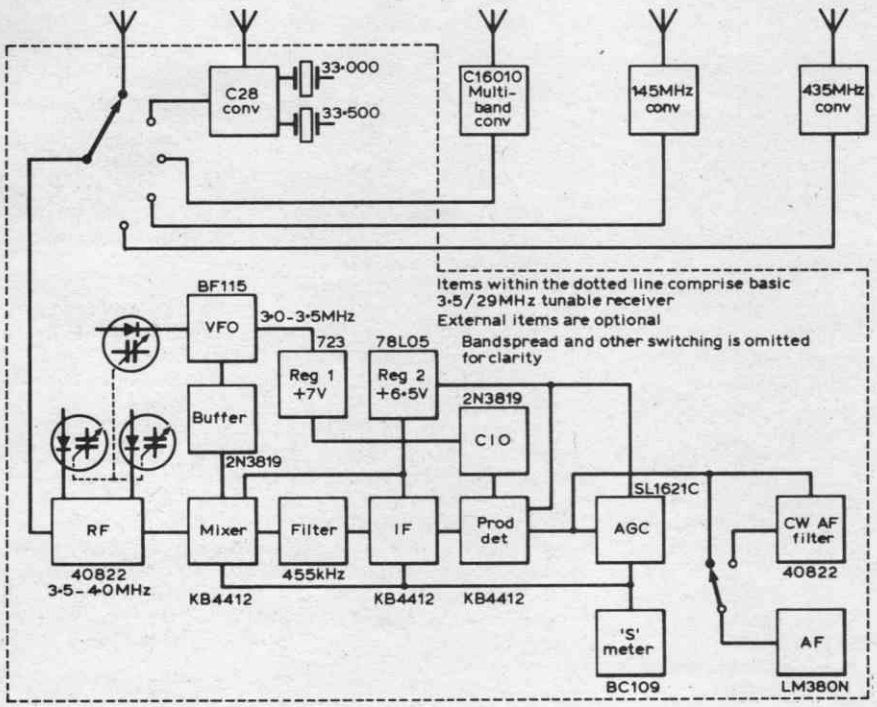
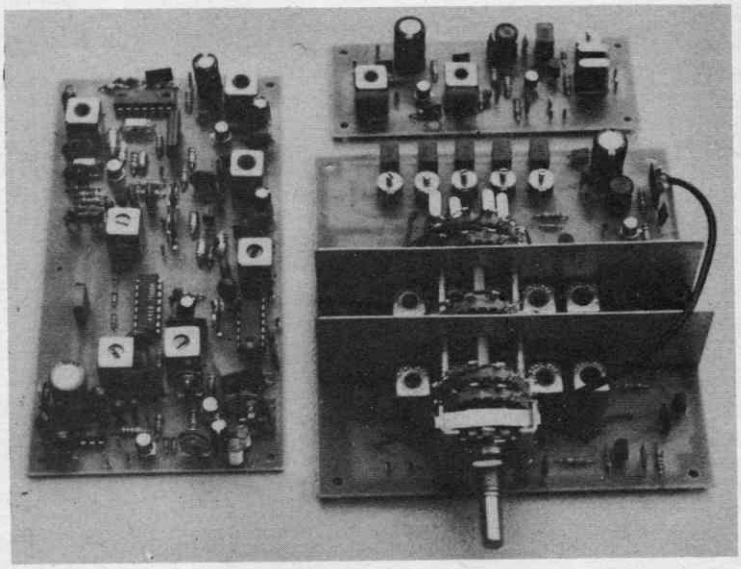


Fig 1. Block diagram of the receiver

*17 Heath Crescent, Hellesdon, Norwich, Norfolk NR6 6XD.



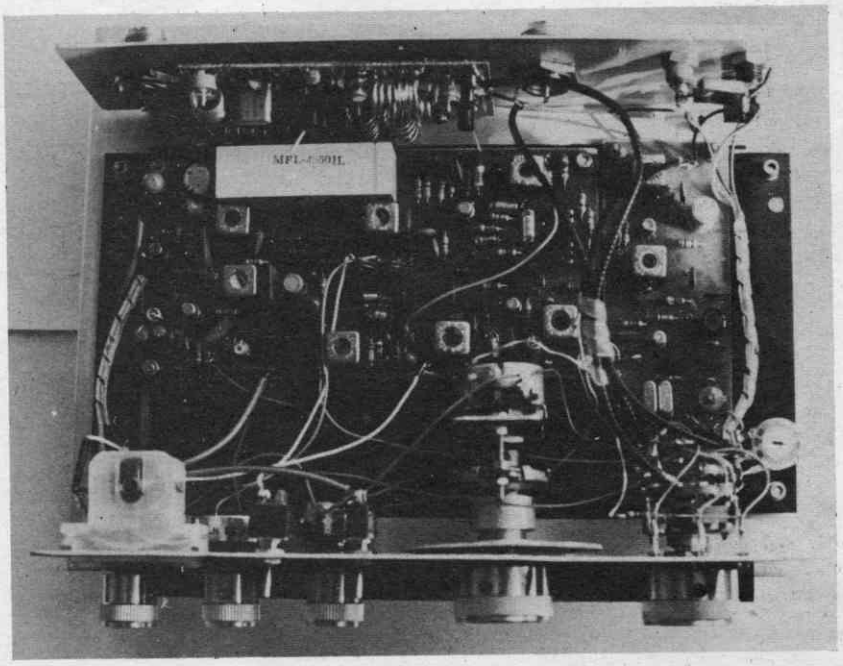
Left, the RX-80 receiver board; right, the C1601D hf bands converter with the 29–30MHz converter behind

The unit supplied for review was in the form of a fully-built receiver, with an internal Microwave Modules 144MHz converter, demonstrating how an Oscar receiver could be built from the kits available (cabinet, knobs etc would be supplied by the constructor). In addition, a multiband hf converter covering the 1·8, 7, 14 and 21MHz amateur bands is available for building a normal hf receiver. The built unit was housed in a 225 by 175 by 65mm neat casing, weighing 1·2kg. Although miniaturized, manipulation and operation is readily performed.

The stability was found to be excellent, even under mobile-in-motion battery fluctuation conditions, the current demand varying from 100 to 200mA according to the audio demand; this being adequate for even a quite noisy car. The rf gain is more than adequate, giving better than S9 signals from the Oscar beacons on both the 29 and 145MHz downlinks even when simple mobile $\lambda/4$ whips were used on these bands, a sensitivity rarely evidenced with receivers at six times the cost.

The audio output was clean, crisp and plentiful, producing excellent usb and lsb signals, and clear clean cw with the audio filter switched into circuit. The tuning, incorporating a mechanical fall-in slow-motion drive, and an additional peak control for fine adjustment—useful in doppler correction, was adequate despite the small dial, and simple to read within a few kilohertz. "Warm-up" drift seemed totally absent, and the excellent mechanical and electronic stability gave no noticeable drift even after an hour's operation.

The S-meter, although very unusual in its read-out of the fast attack and slow decay alc system, gave a far better indication and read-out than the more usual type, and the steady reading on both fast cw and ssb is very useful for real relative reports. The alc circuitry performs well, even under extremely strong signal conditions.



Interior layout of the modules showing rear-mounted 145–29MHz converter, main RX-80 3·5–4MHz tunable i.f. with mechanical filter, and the 29–30MHz converter mounted on the right-hand side. PL259 sockets on the rear panel are for vhf and hf antenna connectors, slot sockets for the power supply, and jack receptacle for the loudspeaker connection

Photos: Steve Jones

The sensitivity of the receiver is truly amazing, putting to shame the reviewer's commercial receiver, aligned at 29·450MHz with its 18dB gain low-noise preamplifier. Sub-horizon Oscar signals were clearly audible, yet breakthrough from his 145·9 and 432MHz signals, despite the parallel feeders and close antenna proximity, was completely absent. Direct on 3·5MHz, the AMSAT-UK net and even the American east-coast net were fully copied. On 144MHz the sensitivity was too great, if anything, as strong signals of 1kW erp in line-of-sight outside the band tended to block the receiver, but a resistive attenuator cures this. With Oscar at the furthest horizon point, the reviewer's 1W erp uplink-returned signals were audible.

The selectivity is adequate, particularly on cw with the audio filter in circuit ringing at some 2kHz, and while the reviewer prefers a much lower beat frequency to permit aural octive separation, copy was excellent. (This frequency is adjustable on the pcb.) With an outboard 435 to 29 receive converter, the receiver was tried on Mode J with excellent results, signals being quite copyable even using a hand-held crossed dipole inside the shack.

The set will enable the Oscar enthusiast to follow the nets, the Mode A downlinks of Oscars 7 and 8, and the Mode B downlink of Oscar 7, plus the 29MHz RS satellite downlink band.

The basic kit for the tunable i.f. comes at under £35, with the additional 29MHz converter (less crystals) under £10, and the hf multiband converter (less crystals) for under £25. The kits come with full and easy-to-follow building instructions, all components, with even the wire and solder supplied. The circuit diagram and positioning points are described, likewise alignment instructions, together with suggested circuiting for a multiband Oscar receiver. A fault-finding and alignment service is offered, or, if preferred, the individual modules can be purchased already built and aligned.

At today's rather frightening prices for modern effective equipment, the unit comes as a welcome bargain, bringing a new range of exciting dx satellite communications or more normal communications within the reach of many who lack the necessary full equipment.

Since this review was written, the 2·1kHz Toko mechanical filter has been replaced by an equivalent bandwidth 11-element ceramic ladder filter. All enquiries should be sent with sae to: A. L. Bailey, G3WPO, 9 Alberta Walk, Worthing, West Sussex BN13 2SG. □

Oscar 7 between sunlight and the earth's shadow

(Continued from page 43)

Oscar 7, which is still sun-lit, crosses the equator from the south.

The above statements are valid for the south-to-north equator crossings, but not for the reverse direction north-to-south crossings which always take place under sunlight conditions.

References

[1] "Bahnen künstlicher Satelliten" (Orbits of artificial satellites) A. Bohrmann. *Hochschultaschenbücher 40/40a.*
[2] *Meyers Handbuch über das Weltall* (Meyer's Handbook on Space). Bibliographisches Institut Mannheim.
[3] "Bahnversatz von Erdsatelliten" (Orbit offset of earth satellites) J. Raddatz. *CQ-DL* 3/79. □

QTC

(Continued from page 33)

power only; auto toneburst on aux switch, channels S20–23, R0, R3–7 and 144·850. Any information to G8RMA, QTHR.

Also in early November from the home of G8RDE, London: Icom IC202S, with case, serial number 9201303; Sony ICF5900N, five-band receiver, serial number 47028.

Any information to G8RDE, QTHR.

"Simple beam heading display"

The author of this article (*Radio Communication* November 1979) advises that there is an error in Fig 2. The track between the eighth and ninth leds (counting south as LED1) on the outer pins should be deleted. The track between these two leds on the inner pins remains.

Air Cadet Radio Amateurs & Instructors Association

Over 80 radio amateurs throughout the country are instructors to the Air Training Corps, and an association is being formed to link them and cadets who are now licensed. Its aim is to produce a news-sheet, have monthly meetings on the air, and generally enable members to exchange ideas about their activities.

Radio within the ATC is growing and instructors are always welcome. Frequencies are allocated at hf, vhf and uhf for training purposes, nets operate every Sunday, field days are held, and normal squadron traffic takes place on one or two evenings every week.

Anyone interested in joining the association is invited to contact G3UDO or G3COY/G4ATC, all QTHR.

New lodge of amateur radio freemasons

It is proposed to form a lodge of freemasons in Brighouse, Yorkshire, for licensed amateur radio freemasons in the north of England.

Interested licensed radio amateurs who are freemasons and would like to be included as founders should contact Dr B. Crisp, G5PW, tel Cleckheaton (0274) 875566.

Can you help?

G4JN, QTHR, requires constructional information for baluns having ratios to match 300Ω balanced feeder to (a) 50Ω and (b) 75Ω coaxial cable, and to handle, say, 200W max p.e.p.

Harry Cliff, VK3HC, 11 Arkins Street, Point Lonsdale, Victoria 3225, Australia, is seeking news of the whereabouts of his closest living relative in the UK—Geoffrey Wright Cliff. As far as VK3HC knows, he is not an amateur but he may be known to some member of the Society.

Geoffrey Cliff joined the Navy as a trainee pilot on leaving school and became an air-radio mechanic. Later he joined the MoD (Navy) as a land surveyor. Until at least mid-1975 he lived in Fleet, Hants, while working at Aldershot, and had previously been posted to Singapore and the Arabian Gulf. He may now be abroad again, possibly in Hong Kong.

technical topics

Pat Hawker, G3VA

THIS month the assortment of circuits, ideas and notes once again emphasises that many of the basic principles and practices of radio communication change less rapidly than we sometimes imagine.

The performance of receivers certainly improves—but the progress is by no means always a steady progression: the early rush to solid-state in the 'sixties set back some aspects of performance by many years, although it opened the way for many worthwhile improvements. It is only recently that we have been able to get both good performance *and* the advantages of solid-state. The problem of tvi, particularly due to the inability of tv sets to cope adequately with strong out-of-band signals, remains severe. There is still room for experimentation in super-regeneration—and even the age-old dry battery still presents problems. And if this is true of basic systems of two-way radio communication, how much more remains to be done in those esoteric areas of "advanced technology" that my fellow contributors describe!

Receiver performance

Some years ago I read an article on hf communication receivers that has stuck firmly in my memory: the author argued strongly that until hf receivers became capable of handling and rejecting signals over the enormous dynamic range of 120dB we could not regard them as fully developed into the ultimate, ideal equipment! By such demanding standards both professionals and amateurs still have quite a way to go: examine the dynamic range, image and spurious responses, i.f. rejection, breakthrough and selectivity response curves etc of even the highest performance receivers and one will find that most designers are more than happy if they can achieve about 90dB for some of these characteristics, while many others still think in terms of 60–70dB. In practical terms, of course, most amateurs, unless their next-door neighbour is an amateur, can safely forget that 120dB figure; nevertheless there *is* still room for better performance than at present, provided always that we remember that the almost indefinable and subjective "operability" (human engineering or ergonomic factors) can be just as important as the purely objective technical specification.

In the fifth annual receiver issue of *Ham Radio* (November 1979), there is a good article on "Measuring receiver dynamic range" by Sidney Kaiser, WB6CTW, which not only provides concise tabulated data on modern receivers/transceivers, but also includes a useful commentary on those features of current equipment that one will seldom find discussed in manufacturers' leaflets or advertisements.

One point that seems worth stressing is that only recently have some solid-state amateur receivers finally caught up (in dynamic range) with the best 15-year-old valve equipments. And even now, although some models are fitted with good double-balanced mixers, these designs do not always extract maximum benefit from this approach (remember that packaged Schottky diode-quad mixers need a fairly high level of oscillator injection, preferably of almost a square-wave switching waveform if they are to achieve the performance of which some are capable).

Then again, WB6CTW points out that response curves of a crystal filter tested out of equipment may be very different from those achieved with the filter installed; this is primarily due to degradation caused by signal leakage around the filter, and is likely to be appreciably higher with, say, an i.f. of 9MHz than at the older figure of 455kHz. He suggests that the current practice of specifying filter shape factors based on −6dB and −60dB performance is not really adequate, by present day standards, to determine whether a receiver will have really good performance; although he does not mention the problem noted several times in *TT* that crystal filters themselves tend to be non-linear and often non-reciprocal and must be considered as having finite dynamic range. He also notes that some of the current receivers may be a good 80dB down ±5kHz from an

Table 1—WB6CTW's test results

Receiver	Two-tone input (dBm)	Gain compression input (dBm)	Bandwidth (kHz) at a rejection of 60dB	70dB	80dB	90dB	S-meter (S9μV, linearity)	Comments
Drake TR7/DR7	−41	−32	3·8	5·6	6·3	6·6	20 fair	Good filters, AGC pumps
Collins 75S3B	−44	−20	4·5	5·1	5·8	6·3	250 good	Good filters
ICOM IC701	−46	−26	5·2	9·4	15·0	—	20 poor	Has-65dB hump ±10kHz out
Ten-Tec Omni D	−48	−20	4·4	6·3	10·0	—	36 good	
Ten-Tec Triton IV/544	−48	−30	6·0				20 poor	
Atlas 350XL	−51	−28		4·0		7·0	150 poor	Good filters
Astro 200	−52	−35						
Yaesu FT901DM	−56	−29	3·6	7·6	17·0	—	8 poor	
Ten-Tec Argonaut	−58	−35	4·0	6·0	14·0	18·0	10 poor	Modified KVG filter
Kenwood TS820S	−60	−34					110 good	
Yaesu FT301S	−64	−36					30 poor	
Heathkit SB303	−64	−41	4·4	6·0	9·0	10·0	70 good	Modified mixers
Collins KWM2	−65	−26	4·5	5·1	6·0	6·3	60 good	Good filters, AGC pumps
Yaesu FT101E	−65	−36					10 good	
Yaesu FT301D	−68	−32					65 poor	
Kenwood TS250	−72	−36	4·0				70 fair	

Note. Kenwood equipment is often marketed in Europe as Trio.

unwanted signal, but this deteriorates to perhaps only 65dB down at 10–15kHz further out.

WB6CTW has strong words on the "dismal" results achieved when checking the linearity and comparability of S-meters; he finds widely differing input voltages can result in S9 readings (between 8 and 250μV) in different models or on different wavebands. While this may not matter much in normal operation, it does make it difficult to use a receiver to check the gain or back-to-front ratio of antennas. He feels that manufacturers could do much better in this respect at little additional expense, making the S-meter a more useful adjunct to operating convenience.

He describes in detail his methods of measuring dynamic characteristics, and provides his results in the form of a table (Table 1). In reproducing his figures one must put in the usual proviso that measurements on individual models may not be truly representative of the range as a whole, and similarly that such measurements are bound to include a degree of measurement error or tolerance. Nor, as we stressed earlier, are these characteristics by any means the only ones of operational importance (for instance, I wish designers would make provision for turning off the agc for cw operation in the presence of interference).

The FT101 again

The way in which some designers have apparently failed to pay sufficient heed to questions of dynamic range is underlined by the way in which ZL2BAF was able to find and cure, at virtually no cost, the problem of limited dynamic range on the extremely popular FT101 series of transceivers, as reported in *TT* August, October 1979. The position of this equipment in WB6CTW's table indicates that his tests were carried out on an unmodified equipment!

As James Roberts, CT1EL/G4HTQ/G8DQR, puts it: "Five minutes to read *TT*, 5min to check my FT101 Mk2 handbook, and then 20min to solve a problem that has been outstanding for some eight years and which had led me to tell people not to buy this rig, due to very poor dynamic range and lack of i.f. gain—there must be a moral to this somewhere!" He also points out that the FT101 was apparently derived from the earlier FT150, FT200 and FT250 series, and that owners of these transceivers might be advised to check their handbooks to ensure that a similar state of affairs does not exist (and looking again at WB6CTN's table indicates that the problem may even have been carried over into the FT301 series—*G3VA*).

Keith Jillings, G3OIT, in reporting his success with the ZL2BAF modification, mentions two further changes he has made to his FT101E that may be of general interest. He writes:

"I found the non-adjustable noise blanker ineffective, and decided to make it 'threshold adjustable'. I replaced R7 (2·2kΩ) on the noise blanker board (PB1582B) with 2·2kΩ plus a 200kΩ preset in series. The preset varies the trigger point of the blanker diodes, D1 and D2. In my case I can turn it up until it takes out completely the ignition noise from the A13 London–Southend road 50 yards away. The modification took only 15min, since the noise blanker module is easily accessible.

"The second change was made after several years NFD experience with the FT101E. When I originally bought this transceiver I fitted a 350Hz cw filter which is a very useful device, particularly for events such as NFD. However, for most of the time it is preferable to work with the wider ssb filter. With a cw filter fitted, the only way to open up the passband is to move the 'mode' switch from *cw* to *tune*. This is too 'fiddly'

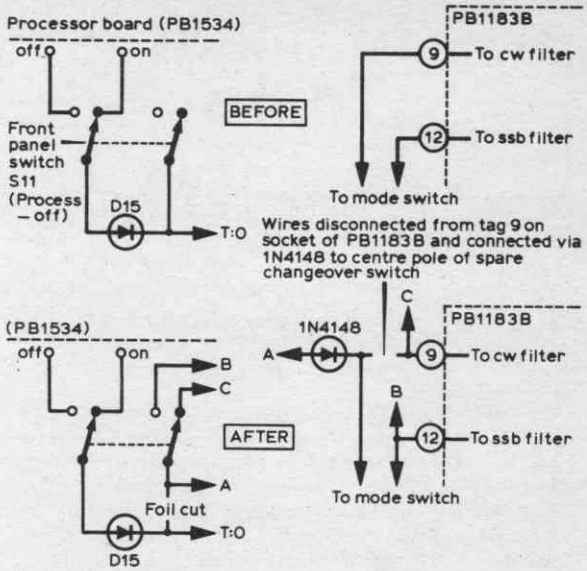


Fig 1. G3OIT's modifications to his FT101E to provide a switching facility for a 350Hz cw filter

in the middle of a fast-moving cw contest, and all our operators agreed a better solution was needed.

"The first proposal was to fit a small slide switch directly to the i.f. unit (PB1183B) to switch over the filters. This proved still fiddly, as the lid of the rig had to be left off to give access to the switch, and in the heat of the contest the switch tended to get pushed too hard, and broke off the pcb (result: no filter, no reception).

"When I uncased the FT101E to carry out the ZL2BAF modifications I noticed that the speech processor switch (S11) is a two-pole changeover type, although only one pole is used. I decided to use this spare pole as a crystal filter in/out switch. On the switch pcb there is a foil from the cold end of the processor switch diode (D15) to the centre point of the spare changeover pole. I cut this foil, then disconnected the wires to pin 9 of the i.f. unit socket (P1183B). I connected these wires via a 1N4148 diode to the centre point of the spare pole. One end of the changeover switch goes to pin 9, the other end to pin 12 of PB1183B. Fig 1 may make this clearer. This 'Mark 2' crystal filter switching works perfectly: the 'process' switch now operates the speech processor as before on ssb, but provides a *narrow/wide* selectivity function on cw."

Super-regen revival?

The response to the notes in *TT* (July 1979) on ZL3VN's work on solid-state super-regenerative circuits showed that there is still a lively interest in this technique which is capable of achieving such very high gains in a single stage. Brian Bower, G3COJ, who in 1961 was responsible for the design of a communications link for tv studio floor managers based on a transistorized super-regen which has only recently been superseded, drew attention to a full-length book *Super-regenerative receivers* by Dr J. R. Whitehead (Cambridge University Press, 1950). This was based on the intensive wartime investigations made into super-regeneration at TRE (now Radar & Signals

Research Establishment), Malvern, when many thousands of pulse responders for radar indentification of ships and aircraft (the "iff" system) were based on super-regen circuits. These required that the initial design should be stable and reproducible, and a lot of work was put into analysis of super-regen circuits in order to overcome their reputation for unreliability, and in solving some of the questions left unanswered by the early research by Armstrong and others.

Incidentally, G3COJ found that the BBC library copy of this book had remained on the shelves ever since he had borrowed it in 1961! The copy I obtained on loan from the National Reference Library also showed few signs of use! It does seem a pity that so little interest has been shown in recent years in super-regeneration.

Of course all the designs in the book are based on valves, and a lot of the pages are devoted to the mathematics of linear and logarithmic modes of operation and an introduction to the concept of automatic gain stabilization. But on the more practical side the book brought together a collection of designs for receivers, transceivers etc, including the superhet form of "super-regen" (which overcomes the problem of radiation at signal frequency); British iff and German "Lichtenstein" radar-type receivers; and the "Fremodyne" simple superhet technique of B. D. Loughlin, which provides an fm broadcast superhet receiver in which only a single double-triode valve is used, apart from the audio power stage, and forms "probably the most economical fm receiver known".

The original Loughlin 88–108MHz Fremodyne circuit (which has appeared in some editions of the *Radio Handbook)* is shown in Fig 2 and uses a 12AT7 (ECC81) valve. While V1b forms a conventional local oscillator (tuning 109·75 to 129·75MHz), V1a forms the super-regenerative stage (at 21·75MHz) functioning simultaneously as mixer, i.f. amplifier and off-tune discriminator. The super-regen is self-quenching at about 20–30kHz by virtue of R1. The af output is taken from the cathode of V1a to the af output stage. While the Fremodyne does radiate unwanted signals, this radiation is not at signal frequency and is of low intensity. The af range is limited, due to the relatively low quenching frequency, and there will also be some signal distortion due to non-linearity. Nevertheless, Dr Whitehead writes: "In spite of this there is no doubt that the receiver fulfils its aim of providing reception of (broadcast) fm signals with the utmost economy of components."

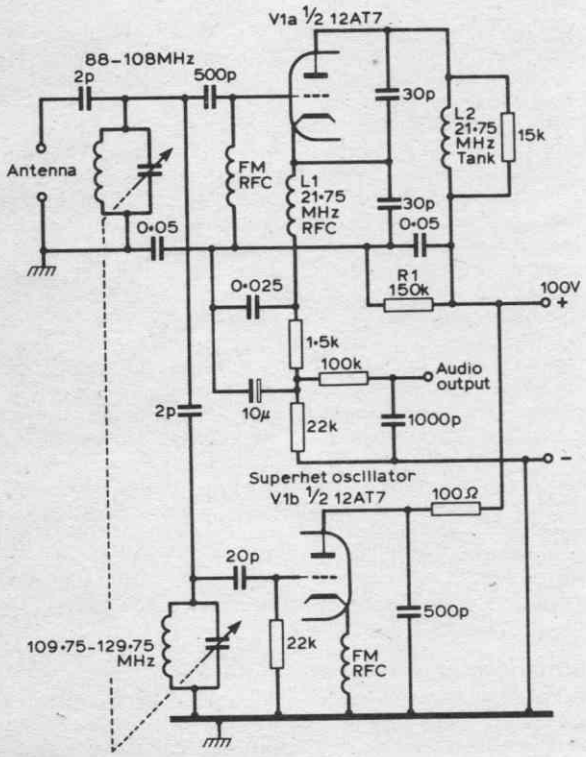


Fig 2. The "Fremodyne" fm receiver using one double-triode valve plus audio output stage

The book notes that a more satisfactory, though more complicated, fm broadcast receiver can be made using a super-regenerative *amplifier* followed by a conventional fm discriminator. I must admit that it had not occurred to me that super-regeneration (like regeneration) can be applied to a non-detecting amplifier; however, as noted below, this idea has also been pursued by ZL3VN in his research into applying super-regeneration to solid-state receivers.

More super-regen topics from ZL3VN

T. J. Wynn, of the Gwent College of Higher Education, has brought to my notice a second, follow-up article by Nat Bradley, ZL3VN ("Almost as much for even less—more super-regenerative topics", *Break-in* May 1979). This article discusses the Bell Laboratories diode damping technique which was advocated for self-quenching super-regen detectors about 10 years ago, but points out that this has little application to the separately-quenched arrangements which the author clearly prefers (the Bell system was aimed not only at improving performance but also at reducing radiation).

Similarly to what is said in Dr Whitehead's book, ZL3VN is concerned with the audio distortion that tends to be a characteristic of any super-regenerative detection with low quenching frequencies, adding: "Why demodulate in the super-regenerative stage at all?"

He describes a receiver in which super-regeneration is used to obtain very high gain rf amplification, feeding the output to a conventional voltage-doubler diode detector. This is shown in Fig 3 and it will be recognized that many other circuit details are similar to those used in the circuits described in *TT* July 1979.

ZL3VN and the editor of *Break-in* comment enthusiastically on the performance that can be achieved with this receiver, adding:

"The Hartley oscillator arrangement shown was used to employ a single-ended tuning capacitor, and feedback is kept to a minimum, consistent with reliable operation, by tapping the source down the tank coil as far as possible. Apart from tuning and volume, the feedback control has proved the only essential adjustable control. Quench frequency is set as high as possible and left at that. Filtering of the quench frequency is still necessary following the detector, as the rf is still delivered modulated by the quenching, and the quench waveform still appears at the detector output.

"A look at the dc voltage at the detector output is quite revealing. Depending on where feedback control is set, or how hard the super-regenerative stage is oscillating, a rise of a quarter of a volt or more will be found with a no more than average signal. Sensitivity is optimum (and radiation least)

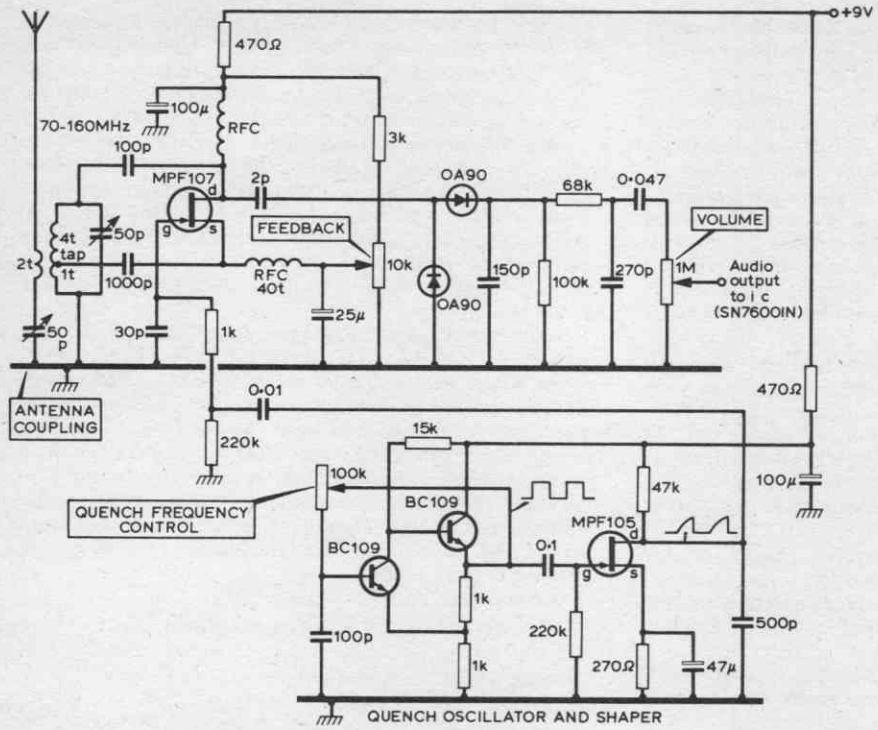


Fig 3. ZL3VN's super-regen receiver in which the detector function is separate from the super-regenerative rf amplifying stage to provide better audio quality

when there is no measurable voltage with no signal, but to make use of the inherent agc action of the super-regenerator you will need to push the feedback a bit more and put up with some quench hiss—it is your choice."

Among other comments received on this topic, P. W. Haylett, G3IPV, draws attention to the similarity of the principles of the super-regen to those of masers and lasers used at microwave and optical frequencies. Chris Webster, G3TBJ (who admits to being a devotee of super-regeneration), notes that it is used in transistorized form in the King Radio Glideslope receivers of about 1970 vintage, as commonly fitted in light aircraft. In this design the super-regen transistor performs a multiple function, although it is not called upon to be particularly sensitive. He mentions that the receiver is not a favourite among avionics engineers—possibly because so many are unfamiliar with super-regeneration?

Batteries

One of the trade magazines recently noted that the UK sales of batteries amounts to some £65-million annually, only £10-million less than the hi-fi market. To judge by what some of the small 9V transistor-radio batteries now cost, this is perhaps not altogether surprising. It has been estimated that battery power costs several hundred times more than mains power. For this reason the rechargeable nicad units tend to work out considerably more economical than disposable batteries for most normal applications. Exceptions are where only very occasional use is made of a battery (and where "shelf life" is thus an important factor) and those remote applications where no mains power for recharging is available within easy reach (in which case, as indicated in *TT* a year or two ago, large zinc-air cells in association with nicad batteries may be the best bet).

Where conventional dry batteries are used it is good sense to employ the largest possible battery, if necessary fixing one to the outside of the case if this is large enough to contain only the small HP3-type batteries.

Recently alkaline manganese batteries (eg "Super Power") cells have gained an increased share of the market and they merit consideration, but only where a continuous load is high enough to justify the additional price. For intermittent use or with a low drain they are less economical than conventional cells, although they tend to have better shelf life and are less prone to leakage. Even the makers admit that for many applications they cannot compete, for all round value, with conventional zinc carbon cells.

In the UK, Berec (Ever Ready) have recently begun producing two types of lithium cells: a 3V cell about the size of a 5p piece which uses a lithium manganese dioxide mix; and a 1½V cell with a sulphide as cathode. These cells, with high energy density and extreme thinness, are very suitable for calculators as well as lcd and quartz analogue watches. The same firm has also begun marketing miniature zinc-air batteries which are suitable for continuous low-current-drain applications. Silver oxide cells form another fast growing market, mainly for quartz watches and slimline calculators. It is worth remembering that with tiny microcells it is advisable not to let the fingers touch the contact surfaces of the battery or the device.

Sunspots and magnetic polarity

Ray Baldwin, G3WZ, was most interested in the recent note about the new-look 22-year sunspot cycle (*TT* September 1979, p832). He mentions that the fact that the solar magnetic field reverses polarity in successive 11-year periods has been known for a much longer period than suggested in my note, although

apparently nobody drew the logical conclusion that this could mean that the cycle could last 22 years rather than 11 years. G3WZ, while he was still the holder of the AA licence 2CBL and an undergraduate, wrote a survey article "Physical properties of sunspots" for the old *T&R Bulletin* way back in October 1938. He then described this reversal of polarity as follows:

"At the sunspot minimum of 1912 the polarity of the northern and southern hemispheres changed sign, the polarity of the northern hemisphere spots then corresponding to the north magnetic pole of the earth. At the next minimum a second change occurred. Unfortunately, the author has been unable to ascertain whether the same thing occurred at the last minimum several years ago . . ." G3WZ comments wryly: "I only wish I had had the wit then to suggest that the true cycle must be 22 years!"

Two-stage varicap tuning

B. S. Sutherland, G3IES, has recently devised a modification which specifically applies to the Yaesu FT101ZD/901 series of transceivers but which could be applied to any of the many equipments that use variable capacitance diodes for "irt" or "clarifier" tuning. He points out that on most equipments the irt range is about 5kHz, which he considers is too coarse for peaking a cw signal with real ease, yet too limited when it comes to finding a clear channel in order to QSY.

His solution is two-stage tuning akin to the old style of band-spreading; one range covers about 2·5kHz, the other about 25kHz. All that is necessary is to replace the irt control (typically a 5kΩ pot) with a 50kΩ pot having a "push-on/push-off" switch incorporated. This is shunted across the two outside terminals with an adjustable preset 1kΩ pot with the wiper strapped to one end. This is then arranged to be switched into circuit with the on/off switch on the new 50kΩ pot and set to provide the desired spread. Centre zero can then be adjusted on the preset on the bottom of the irt circuit board. Owing to the non-linearity of tuning diodes, it is not possible to zero the irt in the 25kHz position, although this is not considered essential since the digital read-out provides a positive indication of frequency.

G3IES mentions that suitable 50kΩ pots with push switches are available from SGS Electronics, 81 St Martin's Street, Hereford (£1 post paid). An alternative means of switching would be to use spare contacts on the "Ext" button on these equipments, these being the extreme outside pair; this will also provide an additional led indication.

High-power 432MHz amplifiers

The February 1979 *TT* included some strong comments by John H. Nelson, G4FRX, of Cambrian Electronics, on the folly of attempting to use vhf bases such as the SK600 when attempting to build linear 4CX250B amplifiers at 432MHz. Yet, once again, the past few months have brought pathetic-sounding telephone calls: "I got this base at a rally and the chap said it was ok for 432MHz but it doesn't look like the base illustrated in the Eimac data sheet". (Data sheet for SK620/SK620A air socket system).

Indeed, often enough the base in question turns out to be an antique base designed for hf that should not be expected to work at 70MHz let alone 432MHz. G4FRX says: "We at Cambrian Electronics feel that we now have the whole thing more or less sorted out. We know of several people who have built the K2RIW amplifier and, on our advice, have used the SK620A base. The result is an amplifier which will not take off whatever they do, and it delivers its proper power without fuss. We stress that for anyone thinking of using the K2RIW as a linear it is *essential* to use the SK620A or a similar base with not more than 1,100pF in the screen bypass capacitor (and we know of no base other than the SK620A which meets this condition). Any higher value capacitance carries with it excessive inductive reactance in the screen-grid circuit, with the result that effective bypassing of the screen to rf is impossible. I recognize some people will accuse me of having an axe to grind, but in my opinion the curses should be directed at those rally salesmen who don't know a uhf base from a dishwasher. We are always prepared to try to help anyone with big linear problems."

Incidentally an alternative design to the K2RIW is described by Stephen Powlishen, K1FO, in *QST* October 1979, pp11-4: "A grounded-grid kW amplifier for 432MHz". This author, after building several 4CX250-type amplifiers, felt that the performance when biased for linear operation left something to be desired. His design provides over 500W output with 25W drive (ht about 2kV), and he claims that this approach, using a high-mu triode, represents "one of the easiest, most reliable methods of becoming a big gun on uhf". The main snag, presumably, is that the 8874 triode is not particularly easy to come by at surplus prices.

Heart attacks and geomagnetic activity

A few months ago (*TT* May 1979, p423) reference was made to an apparent link that had been found in India between the daily number of admissions to cardiac hospital wards and geomagnetic activity (Kp) as reported in a letter in *Nature*. Those who may have been worried at the thought of the present sunspot maximum may be relieved to know from a further letter (*Nature* 18 October 1979) that a group of medical researchers in the Birmingham area have now made a similar investigation but have been unable to confirm the earlier results; in other words they could find no statistical correlation between Kp and heart attacks. They checked the records of 6,298 hospital admissions in the Warwickshire area for patients suffering acute myocardial infarction over a 720-day period in 1969–70 against records of geomagnetic activity. While, of course, there may be differences between effects in India and in the UK, there is a clear absence of any evidence to suggest such a link here, and it is possible that the Indian electrocardiographic equipment itself was susceptible to external magnetic fields leading to different diagnoses.

Anyone out there?

A recent scientific conference was held to try to puzzle out just how many sets of little green men there are out there in the vast Milky Way galaxy waiting to contact Mother Earth. Opinions differed all the way from the "10,000,000,000" of I. Shklovsky (Sternberg Astronomical Institute) to "about 1" of M. Hart (Trinity University). Others took a middle stance, suggesting rather more than one but not very many in view of the so-far negative results of all searches for extra-terrestrial radio beacons. While such searches are nowadays considered scientifically respectable there is still a difficulty in obtaining official funding. The Russians, it seems, have plans for a fully automated and continuous search programme to be based on using widely separated antennas on the ground linked with a large 10m dish antenna in space. But I guess it will still be some time before anyone, professional or amateur, will be able to claim my WAG (Worked All Galaxy) award. □

4-2-70

Graham Knight, GM8FFX*

EI2W works 40 states on 50MHz

Harry Wilson, EI2W, in Dublin, the only licensed 50MHz station in northern Europe, has now had contacts with stations in 40 USA states. In just five days of operation he worked 297 separate stations, including three Canadian Provinces, 37 W5s, six W7s, and four stations in California. EI2W is using a Yaesu FT620 transverter running about 40W to a 3-el beam made out of parts of a television antenna. He notes that activity is higher than it was during the last solar peak in 1957-8, and he finds contacts are much easier to establish now on ssb compared with the old a.m. days. EI2W feels that 50MHz activity has not yet peaked, and he hopes that a contact between an American station on 50MHz and a European station on 70MHz may be possible during this solar cycle. During the peak in 1957-8 he conducted many tests with Ed Tilton, W1HDQ, but the maximum usable frequency only reached up to 67·5MHz and no 50/70MHz QSO took place.

Chris Tran, GM3WOJ, winner of so many 70MHz contests, is very interested in the possibility of establishing the first 50/70MHz transatlantic contact. The huge 9-el 70MHz beam at Dumfries is now permanently pointing towards the USA and Canada, just waiting for the day when the muf reaches above 70MHz. GM3WOJ is in an ideal location for contacts to the west, and he is hopeful of establishing contact with VE1AVX who has a 9-el beam for the 50MHz band and is now equipped for reception on 70MHz. GM3WOJ has also been busy working crossband to 50MHz from 28MHz, and has been successful in contacting many VE and W stations along with others in Costa Rica and Puerto Rico.

Many members took advantage of the tremendous conditions on the 50MHz band to work new states and countries. George Hall, WB2TFH, from Saddle Brook, New Jersey, reports that EI2W's signal was S9 for over an hour while he was working stations all over America. WB2TFH uses a Collins 62S1 transverter (a model which has a single 4CX250B pa on 144 and 50MHz) running 60W to a KLM 8-el beam at 33ft agl. WB2TFH is also a beacon keeper and reports that beacon N2CG on 50·070MHz runs 6W to a 3-el beam at 25ft. He would appreciate any reception reports, and these can be mailed to 18 Miller Street, Saddle Brook, New Jersey, USA.

John Branegan, of Saline, Fife, GM4IHJ, has been paying particular attention to the 50MHz openings as part of his studies of the various exotic modes of vhf propagation. Using an Eddystone 770R general coverage vhf receiver he has heard VE1ASJ, VE1AVX, K1BXC, K2CBA, K1KI, W2UTH and VE2CRA. GM4IHJ found it fascinating to monitor both around 28·885MHz and on 50MHz; he likens the operational techniques to that of a well-rehearsed orchestra with W1HDQ conducting.

John Roberts, G8FDJ, has of course been unable to transmit on 28MHz but has nevertheless had great fun listening to the 50MHz signals on just a 6ft piece of wire—this modest antenna enabled G8FDJ to hear W1EJ, W1RJA, WA1UQC, and a 5-and-9 signal from VE1BXC/1. Alex Allan, GM3ZBE, near Inverurie, worked more than 100 stations in a single weekend of operation in mid-November, and he too is looking forward to the possibility of a 70/50MHz crossband QSO in the next few months. Angus McKenzie, G3OSS, worked 20 stations crossband to 50MHz on the afternoon of 4 November, the best signal heard was that of VE1ASJ who peaked at S9+30dB.

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50MHz mobile!

From the reports on GB2RS and the details in these pages readers will be aware that the 50MHz band has been alive and kicking since October. Readers who have receivers for the 50MHz band will have been amazed at just how strong signals have been, and at times the 30kHz above 50·100MHz has sounded like a section of the 14MHz band during a contest. Roger Barker, G4IDE, in Wolverhampton, has taken crossband to 50MHz operation one stage further by operating while mobile. After hearing strong states-side signals on his home equipment with just an indoor dipole, he decided to try crossband contacts from his car. The mobile equipment consists of a converter for 50MHz which feeds signals to an IC202, and on transmit he uses an FT7.

The antennas were a boot-mounted G-Whip for transmit on 28MHz and a simple $\lambda/4$ on the car roof. G4IDE has worked dozens of stations crossband using this set-up, and the American and Canadian stations usually remark that he is their first European mobile operator. G4IDE likes operating mobile crossband, and hopes the 50MHz openings will continue for some considerable time as he finds working transatlantic vhf dx much more interesting than working stations through the local repeaters.

Solar activity report

Solar rotation No 1688, which started on 3 November and ended on 30 November, saw the most spectacular rise in solar activity between 6 and 12 November, with records being broken day after day. The sunspot Wolf numbers reached a staggering 416 on 10 November—the highest of this cycle, and it was accompanied by a figure of 383 for the same day's 2,800MHz solar flux. Ten-type flares, M-type flares, and X-ray bursts were all featured during this period of intense solar activity. The sunspot Wolf number fell to 252 on 12 November yet still gave a fantastic weekly average figure of 326.

Many of the world's solar observers predicted that the period of rotation 1688 could have been the peak of Cycle 21. If they are correct we have passed the maximum period of solar activity for the cycle. Perhaps they are correct and we are now into a period of decline in this cycle; other observers predict that the peak will come later. Meantime we can all make the best of the excellent conditions, and before six months have passed we should know for certain the date of the peak in solar activity.

True IARU records

As readers of *4-2-70* are aware, all the British vhf records are kept by Jack Hum, G5UM, who checks them and forwards them to the IARU Region 1 co-ordinator—SM5AGM. Normally the only proof required is that QSL cards confirming the contact are exchanged, then SM5AGM enters that contact to his official list of vhf firsts. The present IARU Region 1 record for an auroral contact on 144MHz is between G3CHN (YK61b) and UP2BBC (LP07d)—a distance of 1,915km.

Recently, on the night of 18 August 1979, many stations in Norway, Sweden, Finland and Germany thought they had broken the G3CHN/UP2BBC auroral record by several hundred miles as they all worked UA4NM. For example, the distance between UA4NM in YS29a square and DK1KO in FN12g is more than 2,450km—500km greater than the present record.

It has now been brought to SM5AGM's attention that a vhf meeting was held in Tallinn (QTH locator square MT) on 18 August. This Russian meeting was also attended by several Swedish vhf operators who reported that UA4NM was present at the meeting and made all his auroral contacts from MT square. Despite his location in Tallinn UA4NM gave his location as his home QTH in square YS29a. This means that all the UA4NM QSOs completed on that night were actually made with a station operating from a location 1,200km shorter than the given distance.

SM5AGM regrets having to make this public but it is absolutely essential to give the true QTH locator while operating on dx expeditions, otherwise the whole system of keeping dx records is meaningless. Unfortunately this is not the first time this sort of thing has happened, and your scribe remembers the fuss created by UK5IAA who operated from UA1 but used his home callsign and QTH. G3POI has received cards from Russian stations confirming contacts which did not take place, and GM8FFX still smiles at the pile of Italian QSL cards which confirm sporadic-E contacts which were definitely incomplete. Fortunately this regrettable incident has come to light in a comparatively short time and, of course, the old record of G3CHN and UP2BBC still stands.

VHF propagation studies

As is reported elsewhere in this month's *4-2-70* John Branegan, GM4IHJ, has been taking advantage of the excellent 50MHz conditions to work crossband to stations all over America. Because John is free to listen during the day he has made a special study of vhf propagation during the last few months. He has noticed Canadian Television signals on ChA2 coming in quite strongly, but these are swamped in Central Scotland by the local Kirk o' Shotts transmitter which is also on 55MHz, but GM4IHJ can still pick out the 525-line 60Hz picture on an oscilloscope. He notes that the maximum usable frequency to the east has frequently gone above 50MHz by 0745gmt. Although there have been plenty of Russian ChR1 signals, no Japanese signals have yet been received. GM4IHJ notes that when the transatlantic path on 50MHz is poor the amateur signals can be heard for short 3 or 4s bursts—rather like meteor scatter.

GM4IHJ has been making careful notes on each day's signals as the solar activity increased. His log records correlate with the theories expressed by G8KG in previous *Radio Communication* articles that the best time for transatlantic 50MHz dx is when the solar flux is high and the Kp magnetic index figures are low. GM4IHJ notes that the north to south path on 50MHz is still good when the Kp figures are high but that the east to west path is poor on those days.

John Branegan has also been spending a great deal of time studying the ionospheric activity in the sub-polar auroral zone—this area has been tremendously disturbed in the last few months. GM4IHJ keeps a regular check on where satellite scintillation occurs on polar paths, and uses this data to define both the instantaneous location of the auroral oval and the total electron count along the satellite line of sight. John Branegan's studies have greatly interested Dr Webster of NASA, Goddard, who confirmed that their research showed that the electron count in the sub-polar zone had gone up by more than an order of magnitude in recent months. GM4IHJ's results, along with those of Angus McGugan, GM8PSM (on Tiros/Meteor), all confirmed that plasma electron densities above electrons/cm were present at times during the month of November and, most interestingly, at heights above the normal auroral 110km zone. In normal circumstances electron density levels of this order will act as near perfect vertical reflectors to frequencies up to 30MHz and will scatter propagate signals at frequencies of up to at least 250MHz.

These are discrete chunks of plasma where turbulence has locally increased the density of material available for ionization—they are not layers, but they are propagating 144MHz signals. The clearest indication GM4IHJ has of this "scatter propagation on 144MHz" is that he, G3IOR, and several stations located in Alaska, have all heard double signals on satellites using 144MHz. The second signal is spaced nearly 750Hz from the normal signal, sometimes has an auroral tone, and is at times fractionally delayed.

Dr Webster of NASA, who also holds the callsign WB2TNC, reports that the transequatorial ionosphere is equally disturbed, even up as high as 435MHz. Several USA stations have reported exceptional long-haul dx which has shown up for a few brief moments on 144MHz. A special warning has gone out to all the American operators who have high erps, and especially to those who can combine high power with eme arrays which can be depressed and beamed towards the southern horizon.

As a result of these propagation studies on both sides of the Atlantic, John Branegan thinks it could be possible for high-powered 144MHz signals to scatter forward from the auroral zones, and G or GM signals could perhaps reach VE1 or UA9 by this method. The peak times to test this theory would appear to be about two hours after a solar flare, with activity remaining high for a further 36 hours. The northern plasma density levels are likely to reduce during the month of January as daylight gets briefer and the sun angle decreases, but the density levels should increase again sharply in late February and in March.

John Branegan's well-documented researches are proving to be of great interest to amateurs and professionals alike, and he concludes his report to *4-2-70* with what can only be called a very calculated guess—John simply predicts new records achieved by new vhf propagation modes within the next six months.

Auroral reports

As is usual at solar activity peaks there has been a marked reduction in the number of auroral openings which have affected vhf propagation. GM4ILS, in Elgin, has been keeping a special watch for auroras by checking for reception of OY6VHF (144·885MHz) and of SK4MPI on 144·960MHz. The most recent dates of auroral openings are 18 and 19 September, 11, 13, 15, 16, 23, 29 and 30 October, and 7, 9 and 18 November. Many of these events were short lived, with only the beacons being heard and no auroral QSOs taking place.

On the night of 7 November your scribe was driving north from Aberdeen to speak at the Moray Firth ARS when he noticed a bright visual aurora—it was spread over the north-east sky, was mainly blue in colour, and had several predominant rays and arcs. Those of us who live well away from town

lighting in the north of Britain see auroras like this on a regular basis and use these visual sightings as warnings of impending radio events. At the meeting Ron Adams, GM4ILS, confirmed that there had indeed been a radio aurora and that he had been working stations in Denmark and Sweden on 144MHz cw.

Another visual sighting which coincided with a radio event was made by Stewart Cooper, GM4AFF, from a site 15 miles north of Lerwick in the Shetland Islands. From this most northerly location GM4AFF could see a huge aurora extending overhead and covering a large portion of the night sky with a colourful and ever-changing display which at times showed arcs and at other times displayed rays. GM4AFF kindly telephoned a warning to your scribe, who was able to work stations via the aurora on 144MHz. Despite the brightness of the display the radio event was comparatively weak, being confined to stations well to the north. John Branegan, GM4IHJ, at Saline in Fife, had noticed this aurora earlier in the day and noted that the radio event started at 1630gmt and ended at 1710gmt. The later aurora faded out on the radio at 2300gmt, but faint visual signs of the aurora could still be seen at Aberdeen after midnight. Despite your scribe staying up until 0330gmt no third phase occurred.

Calling frequency for a.m.—144·650MHz

A gremlin crept into the copy for the November *4-2-70*. The calling frequency for a.m. is 144·650MHz in the all-mode section. Once contact has been established on 144·650MHz the vhf committee recommends that a.m. operators then move frequency within the all-mode section. Care must of course be taken in choosing a suitable frequency to which to QSY which will avoid those frequencies which have been recommended for other specialist users. This new a.m. calling frequency seems to be working out well, and several stations have been monitored using 144·650MHz as a proper calling frequency, with all the operators heard moving quickly off the calling frequency once a contact had been established.

Special repeaters

Letters have been received from members enquiring as to whether linear or amateur television repeaters will ever be allowed on the air in Britain. Projects of this type will be considered by the Society on their merit if presented to the RSGB in the required format. All one-off repeater proposals can take a considerable time to discuss and perhaps ultimately licence. All new groups considering any repeater proposal should write to the general manager at RSGB HQ to obtain the *Guide to repeater licensing* which details all the Home Office and Society requirements for making a repeater proposal.

GB3SK now operational on RB6

The well-organized Kent Repeater Group has added GB3SK to the ranks of the repeaters which come under its wing. A large team effort by G3OJZ, G3TDP, G3XDV, G4EGQ, G8EGT, G8FEZ, G8KEN, G8KSD, G8KVC, G8PXA and swl Bob Sneddon, in digging, concreting, tree lopping, mast erection and antenna rigging, got the GB3SK colinear antenna 60ft agl right on the edge of a hill 600ft asl on an excellent site overlooking Folkestone and the Romney Marshes. Thanks to their efforts and those of the repeater builders, GB3SK came on the air on 17 November on ChRB6; although at the moment only low power is being used, coverage is very good. Ken Crouch, G8KEN, of 14 Victoria Road, Capel le Ferne, Folkestone, would appreciate reports on the repeater's operation on low power.

Proposed GB3SS repeater

A proposal has been submitted by the Moray Firth FM Group to establish a vhf repeater on a site at Knockmore. The Moray Firth area is presently not covered by any repeater, and the FM Group has been formed by six members of the Moray Firth ARS who are keen to establish what will be the most northerly repeater in Britain.

A Uniden 2030 transceiver has been donated to the group by Lowe Electronics, and this will form the heart of the unit. GM4BYT, the technical manager of the GB3GN group, and GM5CSY have spent a tremendous number of hours making all the hardware necessary for the new repeater. Tony Whittaker, G3RKL, of Sheffield University, has supplied GB3HH-type logic control, and full commercial specification dipole antennas have been obtained. A full proposal has been submitted to the Society with a request for the callsign GB3SS, and it is hoped that this repeater may be licensed before the summer of this year. Further information about this proposed repeater can be obtained from Ron Adams, GM4ILS, 1 Woodlands Crescent, Bishopmill, Elgin, Morayshire.

Repeater group of the month—GB3HR

The South West Hertfordshire UHF Group, which is affiliated to the RSGB, is organized under the chairmanship of Dave John, G3WCB. The group is responsible for operating and maintaining GB3HR at Bushey Heath. This repeater on ChRB14 (433·350MHz output and 434·950MHz input) has been operational for more than three years and was one of the original batch of 22 Phase 1 uhf repeaters which were planned by the VHF Committee and its Repeater Working Group.

During GB3HR's first year of operation a number of tests were made in order to establish an understanding of the terrain around Bushey Heath. These tests led to the use of the present antenna system which consists of two, four-dipole arrays phased into a colinear configuration. Although looking identical, the two arrays have different electrical characteristics. The upper stack of four dipoles is phased so as to receive the maximum signal strength from a point horizontal to the dipoles. The lower stack of dipoles receives (or in this case transmits) the main lobe 10° below the horizon, and this improves local coverage. However, in certain directions the group's technical team—Roland Taylor, G8CKF, and Peter Hickey, G3WDX—has noticed the balance of transmit to receive performance is poor due to the shadow cast over areas such as Stanmore and Edgware. This effect is most noticeable to the east and south-east of the repeater, and the technical team reports that this problem could only be overcome by installing the antennas on a much higher mast. Apart from these two areas the group is very pleased with the reports received on the coverage of GB3HR, especially as the repeater only runs 7W erp.

Every 433MHz repeater is allocated an approximate 33km square of coverage, and this area determines the major part of the primary service area, as was detailed in *Radio Communication* April 1976. Operators using GB3HR find they can normally maintain contact through the repeater to the edge of the service area and then transfer frequency to that of another uhf repeater. Don McLean, G3DNQ, has already described in *4-2-70* how he is able to operate through several uhf repeaters

on his journey home from Central London to Bishop's Stortford. Many of the daily commuters use the uhf repeaters like GB3SV and GB3HR on a regular basis while travelling on the motorways in and out of London.

GB3HR was constructed from ex-Storno transistorized equipment, with each board being individually mounted in screened boxes to ensure maximum isolation. The group is aware that many operators use GB3HR as a long-term standard for frequency checking and receiver alignment, and to this end they take great care to ensure the stability of GB3HR's transmitted signal. The crystals which determine the frequency are in electronically controlled ovens, and the oscillators are running continuously regardless of whether the repeater is being used. The frequencies are checked on a monthly basis, and these visits have revealed that the stability of GB3HR is better than ±200Hz at any time.

Changes were made to the logic last year to allow easier access, and the time-out facility has now been removed. The GB3HR group does seek the views of users, and would like to hear whether users like or dislike any aspect of the GB3HR service. GB3HR is of course licensed for F1, F2 and F3 transmissions, and it is interesting to note that several rtty contacts have been established through the repeater in recent months, and the group is keen to conduct further tests and experiments through GB3HR. Further information about the group, which is also responsible for the GB3SWH beacon on 10·3680GHz, can be obtained by writing to the treasurer, Brian Greenaway, G3THQ, 5 Landsdown Grove, London NW10 1PL.

RSGB VHF Convention—8 March

The VHF and Microwave Committees have been very busy organizing the ever-popular RSGB VHF Convention which will take place at the Winning Post, Whitton, on Saturday 8 March 1980. Three streams of lectures will take place in the excellent accommodation available at the adjacent Whitton School. A full lecture programme has been arranged, including talks on satellites by Amsat UK, moonbounce by Peter Blair, G3LTF, and microprocessors by GM8FFX and GM8NCM. Bob Burns, G3OUU, and his band have been booked to provide the music at the informal evening dinner, and full details of this, the No 1 event in the vhf enthusiasts calendar, will be given in next month's *Radio Communication*.

Television dx

Mike Allmark, in Leeds, has deserted the meteor scatter frequencies on 144MHz to concentrate on the exceptional television dx being made available on a daily basis thanks to the high sunspot activity. Mike saw sync pulses on ChA0 (46·25MHz) at 0830gmt on 5 November and thinks these came from Australia. Other early morning dx has included Malaysia on E2 and many USSR stations on ChR1 (49·75MHz), with these long-distance signals usually continuing to be received until mid-day. Many American and Carribean stations have been received from 1300gmt until sunset. Mike also reports hearing a tape recording of BBC1 television signals recorded in Perth, Western Australia, and he says it is obvious from the tapes that British television signals have been very strongly received down under. Mike wonders if any British amateur has heard a 52MHz signal from Australia yet. So far, no one has reported any Australian crossband to 50MHz contacts, although Gordon Pheasant, G4BPY, has heard the Australian beacon VK6RTV which transmits on 52·3MHz.

New RSGB *Call book*

The 1980 edition of the *RSGB Amateur Radio Call Book* is now available from RSGB Publications (Sales), 35 Doughty Street, London. VHF operators always welcome the latest edition of the call book as it contains the most up-to-date listing of all the names and addresses of amateurs resident in all parts of the UK and the Republic or Ireland. More than 2,990 names and addresses have been added since the last edition and 4,010 changes have been recorded—in other words if you are still using last year's edition you are missing out on 7,000 new pieces of information. The book also lists hf and vhf beacons, and all the RSGB repeaters.

Compiling the call book is no easy task, and the work of updating the addresses from the information supplied by the Home Office is carried out on a weekly basis at the Society's editorial office at Chelmsford by the assistant editor of *Radio Communication*, Margaret Collins, who is to be thanked for all her work in compiling the new format call book, which almost all vhf operators find to be an invaluable operating aid.

Supreme Award to G3SPJ

Colin Woolf, of London, recently received his Supreme Award which he attained by winning three Senior Awards. The fact that this award is only No 27 clearly shows that he has joined a small but "supreme" group of vhf dx operators. G3SPJ is of course best known for his outstanding dx work on the 70MHz band, where his consistent dx efforts have earned him the title of the "London 70MHz beacon".

144MHz Standard Awards have recently been attained by G8NNJ, of Romford,—No 531, G4EEV, of Scarborough,—No 532, and by G8OMI of Solihull—No 533. On the 432MHz Senior Award front, G3TDG, of Biggin Hill, has been awarded certificate No 51.

Late news

The excellent conditions on the 50MHz band have continued, with daily cross-band contacts being made by UK stations transmitting on the 28MHz band. G3COJ, G3FXB, G3MCS, G3PLP, G4BPY and G5KW have been among the most active operators who have been working to all parts of America and some stations in KV4, KP4 and HC. G8KG feels fairly certain that the peak of Solar Cycle 21 occurred on 16 November, and he will be monitoring the 50MHz band with great interest in the next few months to check whether activity tails off as it did at the last peak 22 years ago. A new 50MHz beacon has been established by VE1EI on 144·9025MHz—full details next month.

A very late-in-the-year large-scale tropospheric opening occurred during the last few days of November. Many vhf operators noticed the BBC captions advising uhf television viewers that propagation conditions were such that co-channel interference was upsetting viewers' reception. These conditions may be annoying for the average viewer, but signal good conditions to knowledgeable vhf amateurs. G6GN in Bristol reported the opening as one of the best in the last five years, with strong signals being heard from the Continent on both 144MHz and 432MHz. G3HCW in Knottingley, Yorkshire, reported 432MHz as being wide open, with tremendous signals from stations as far away as Denmark and Germany. GM8IFT and GM4IAN were surprised to hear OZ stations using just 300mW on 432MHz in this outstanding late-in-the-year opening. □

the month on the air

John Allaway, G3FKM *

AS this is the first *MOTA* of a new decade it seems appropriate to remind readers of the orderly way in which our hf and lf bands are split up so that fair shares are available to all without too much mutual interference! It is important to remember that although the IARU Region 1 Band Plan is a *voluntary* scheme all good operators adhere to it. A point worth noting is that a small section of each band is set aside primarily for the use of rtty as well as cw enthusiasts—unfortunately it seems to be the practice of some people to use these areas for tuning-up their equipment, possibly under the impression that the unfamiliar signals are from intruders to the band.

The IARU Region 1 Band Plan is as follows:

3·5–3·6MHz	cw	7–7·04MHz	cw
3·6MHz±20kHz	rtty	7·04MHz±5kHz	rtty
3·6–3·8MHz	cw and phone	7·04–7·1MHz	cw and phone
14–14·1MHz	cw	21–21·1MHz	cw
14·09MHz±10kHz	rtty	21·1MHz±20kHz	rtty
14·1–14·35MHz	cw and phone	21·15–21·45MHz	cw and phone
	28–28·2MHz		cw
	28·1MHz±50kHz		rtty
	28·2–29·7MHz		cw and phone

The sections 3,500 to 3,510kHz and 3,790 to 3,800kHz are reserved for intercontinental working and *should be avoided by stations not seeking such contacts* at times when the propagation is favourable. It is recommended that sstv should operate around 3,735, 7,040, 21,340 and 28,680kHz—all ±5kHz. On 28MHz the band from 28,200 to 28,300kHz is extensively used by beacon stations, and downlink signals from satellites will be found in the 29,400 to 29,550kHz section.

Some misunderstanding seems to have arisen as a result of the paragraph in the October *MOTA* which appeared under the "News from overseas" heading. The item was a precis of P29JS's letter and was not intended in any way to imply criticism of the Eire national society IRTS, whose behaviour throughout a period which caused its members considerable embarrassment could not be faulted.

GM4ELV has asked for readers to be informed that his callsign is being pirated. Dave gave up his licence recently and his last transmission was on 25 July 1979.

G3PXD has been receiving QSL cards for "5R8K" and wishes everyone to know that he has no knowledge of such a station (whose callsign suggests that it may not be located anywhere near Malagasy!).

Expeditions

The visit by C5ABK and W4MGN which should have taken place to Guinea (Bissau) during December was postponed.

A bulletin from Iris and Lloyd Colvin dated 8 November said that they had made over 10,000 QSOs from J3ABV, operating on cw and ssb on all bands 1·8 to 28MHz. During the first week of operation they worked over 100 countries, and they repeated this during the CQ WW DX Phone Contest—in all they contacted 152 DXCC countries from Grenada, the largest number they have ever worked in a three- or four-week stay. They left for St Vincent on 9 November, for about a month's stay, and will still be in the Caribbean when this reaches readers.

The W African Comm Research Society departed for N Africa at the beginning of November. Activity as OE3GEA/appropriate prefix was anticipated from as many countries as possible, and frequencies to be watched include 3,525, 3,795, 7,025, 7,095, 14,025, 14,295, 21,025, 21,395 and 28,595kHz.

According to *DX'press* the N2KK expedition should be in Mauritius around the first 10 days of January, then on Rodrigues Is (3B9) from 12 January and Malagasy (5R8) from 20 January. QSLs go to K5CO and donations to WB5WYE.

The Radio Club de Concepcion is planning a visit to Juan Fernandez Is (CE0Z) during January and will be transported there by the Chilean Navy. The callsign to be used may be either CE0Z or CE5CJA/CE0Z, and likely frequencies to be used include 14,080 and 28,480kHz (cw), and 3,700, 7,095, 7,200, 14,210, 21,210 and 28,610kHz ssb. QSLs should be sent (with sae and three ircs) to the address in "QTH Corner".

DX news

Since 1 January 100 stations in Moscow and 25 in each of the other cities where the 1980 Olympic Games will be held will be using special prefixes. UA stations with two-letter suffixes will change the UA to RX, and with three-letter suffixes to RZ. In other areas UK will become RK, UV RV, UW RW, UC2 RZ2, UR2 RU2, UB5 RZ5, UT5 RT5 and UY5 RY5. In addition to this, during the period 1 July to 3 August a special station, RM3O, will be active from Moscow, and RT2O will be on from Tallinn. From 15 July to 3 August RL1O will be on from Leningrad, RK5O from Kiev, and RM2O from Minsk.

The former TN0HL is now using the more correct callsign TN8AJ. He will be there until July and says that his licence has been back-dated to cover the period when he was using the wrong callsign. Joerg is to be found on 21,155kHz at 1500 on Saturdays, often working a list of stations which has been made on the same frequency one hour earlier. N4HX/TT8 is believed to be at the USA Embassy in N'Bjamena, and he has been worked on 21 and 28MHz ssb. Other current African activity includes that by 9X5LE from Rwanda, who has been patronizing 28,608kHz from 1300 almost daily, and by 9X5PP from Burundi, who favours 28,580kHz at about 2000. ZD9GH is thought to appear on 14,240 or 14,270kHz for schedules with WA2JUQ at 2100. Another rare station, D68AM, has been worked recently on the 14 and 21MHz bands using ssb in the lower part of the phone section.

OZ8AE has now left Macquarie Is and should have reached Davis Base on 5 January for a four-day stay and then depart for Mawson, where he is due to arrive on 13 January and stay four days. After this he should return to Mawson from 21 to 24 February and to Davis from 26 February to 4 March.

News from overseas

A most interesting letter has been received from A. Sadjadian, EP2FM, who is a member of RSGB and who received his amateur licence about one year ago—after trying for almost 15 years. He says that there are two or three active Iranian amateurs and that they have high hopes of promoting amateur radio as the Iran Radio Amateur Society is in the process of

*10 Knightlow Road, Birmingham B17 8QB

being established. In this context he has planned slow morse transmissions and is looking for simple easy-to-build cw receivers (and later transmitters) for beginners. EP2FM may be found on cw on 14,051kHz and on ssb on 14,190kHz from 1400 to 1800, and his address is to be found in "QTH Corner".

Alan Taylor, G3DME, has passed along a short note which was written by ZE1AN about the late Charlie Whitmore, ZE1JJ, who died on 3 October last. It says that Charlie was 84 years old and had started experimenting in amateur radio soon after the first world war. He gave himself the callsign WHTSR and then 6SRA, VP6SRA and FO6SRA, until he was given ZE1JJ. (It is interesting to note that at one time the VP prefix was shared by S Rhodesia and Jamaica.) At the age of 83 he had moved house and had re-established his station in his new home.

ZL1AZC has returned home to the UK after eight years in New Zealand and should now be heard as G3YPL. G3ZSS was in Hong Kong in late 1979 as VS6BF, and is probably home again now. Another "refugee" is Keith, G8BBP, who is now VE2AQU and to be found on 28MHz.

Keith Orchard, G3TTC, expects to be on the island of Masirah (off Oman) from mid-January until July and will be getting an A4 call. Keith was ZD8KO from 1971 to 1974 and looks forward to meeting friends old and new. QSLs should be sent to G3TTC, QTHR.

Maurice French, G3ZXD, should be in the Cook Is by now and on the air as G3ZXD/ZK1, or possibly ZK1MF. He will be there for two or three months and hopes to operate on 14, 21 and 28MHz—suggested frequencies being 14,195, 21,290 and 28,450kHz. He will be looking specially for UK contacts.

Art, VK3AOK, has asked G3KSH to pass along the information that VK0AC ceased operating in the Antarctic on 15 November 1977. In spite of this he is still receiving many QSL cards (mainly from Europe) reporting VK0AC transmissions on 7MHz around 2200. The offender calls himself "Bob".

DXCC

October *QST* Honor Roll listings included the following UK stations: (mixed modes) G3HCT, G3FKM (both 319), G3FXB (318), G2BVN, G5VT, GI3IVJ (316), G3JEC (315), G3AAE, GM3ITN (314), G2BOZ, GI3OQR (313); (radiotelephony) G3FKM (319), G3JEC (317), G5VT (316), GI3IVJ (315), G3NLY (314), G3TJW (313), G3UML (311). The numbers indicate the total of different DXCC countries worked and confirmed, and the current maximum is 319.

Kiribati Republic

John Sainsbury, T3KJ, (alias G8HV and ZL1WJ), has supplied up-to-date information on the position in this new republic, formerly the Gilbert, Line and Phoenix Is. He says that it became independent on 12 July 1979 and elected to remain within the British Commonwealth. The British "VR" prefixes were not relinquished until 1200 on 30 September 1979. The new republic incorporates all those islands and atolls which comprised the Northern and Southern Line Is, British and American Phoenix Is, and all of the Gilbert Is. USA interests were physically removed in the following weeks, but technically ceased as of 12 July. As a result the following prefixes became effective at 1201 on 30 September: T3K—The Kiribati (Gilberts) Group, comprising Makin, Butaritari, Marakei, Abiang, Tarawa (including Betio), Maiana, Aranuka, Kuria, Abemama, Nonouti, Tabiteuea, Onotoa, Beru, Nikunau, Tamana, Arorae and Banaba (or Ocean Is); TL3—the Line Is Group, including Washington, Fanning, Christmas, Malden, Starbruck, Caroline, Vostok and Flint Is; T3P—the Phoenix Is (formerly British/US Phoenix) which covers Phoenix, Sydney, Mackean, Kanton, Birnie, Gardner, Hull and Enderbury Is. The licensing authority is The Controller of Telecommunications, Ministry of Communications & Works, PO Box 487, Betio, Tarawa Atoll, Gilbert Is, Kiribati Republic. Amateur licences cost $10 (Australian) and are available on presentation of most foreign amateur licences. John says that at present Kanton is not open to visitors, and in practice it is inaccessible. There is no currently authorized amateur licence for Phoenix.

QTH CORNER

CE0Z	Box 2545, Concepcion, Chile.
EP2FM	A. Sadjaidian, 36 Alame Qazvini Dabestan, Old Shemiran Rd, Teheran, Iran.
FR0MM	Bill Poellmitz, K1MM, 44 Sunset Drive, Framingham, Ma, 01701, USA.
GJ3RAX **GJ3YHU** **GJ4ICD**	PO Box 100, Jersey, CI.
HC8EE **HC8MM**	Rick Dorsch, PO Box 665, Cuenca, Ecuador.
HK0BKX	(new) via WB4QFH, W. V. Wilson, Box 532, W Palm Beach, Fla, 33402, USA.
J3ABV	(see VP2SAX).
K5CO	T. S. Meadows, 4417 Scottsdale St, Mesquite, Texas, 75150, USA.
S2BTF	via LA5NM, M. Bjerrang, Box 210, 9401 Harstad, Norway.
T3KB	P. Wilder, Post Office, Betio, Tarawa, Kiribati.
T3KC	Willie, c/o Posts & Telecomms Dept, Betio, Tarawa, Kiribati.
T3KH	Adrian Sainsbury, via K4WSB, J. Hartley, 512 Severn, Tampa, Fla, 33606, USA.
T3KI	Radio Kiribati, Broadcasting Authority, Bairiki, Tarawa, Kiribati.
T3KJ	J. R. D. Sainsbury, Air Tungaru, Box 274, Bonriki Int'l Airport, Tarawa.
T3LA	via W7OK, W. D. Brickley, Box 95, Las Vegas, Nev, 89101, USA.
VP2SAX	YASME Foundation, PO Box 2025, Castro Valley, Cal, 94546, USA.
VQ9TR	via N2IT, L. A. Dvorsky, 2508 Leeds Av, Northfield, NJ, 08225, USA.
VQ9WJ	via K4NYK, L. R. Schubert Jr, 3807 Greenhill Dr, Chamblee, Ga, 30341, USA.
N0TG/6Y5 **N0WL/6Y5**	via N0TG, R. Rowe, 3237 Connecticut Dr, St Charles, Mo, 63301, USA.
8Z4A	via WA3HUP, Mary Crider, RFD 2-Box 5-A, York Haven, Pa, 17370, USA.

RSGB QSL Bureau, G3DRN, 30 Bodnant Gardens, London SW20 0UD

Top band

VK6HD intends to be active until the end of January on 1,801–1,803kHz on most days between 2045 and 2130. He will listen for replies between 1,820 and 1,835kHz, and asks those who have already worked him not to call in order to give others a chance. Mick has worked over 100 European stations on the band already but still needed GI, GJ, OE and YU at the beginning of this "season".

Stew Perry, W1BB, in his autumn *160 Meter DX Bulletin*, comments on the reduced activity on the band due to the present increase in interest in the higher frequencies. However, he has now worked and confirmed 148 countries and says that PY1RO has been awarded the first 160m DXCC outside N America.

A report from a Hungarian listener suggests that special permits will be issued to HA stations for 1·8MHz, but no reports of any of them being heard have been received.

Contests

Please note that, according to *The DX Bulletin*, the format of the **ARRL DX Contest,** the cw section of which takes place on the weekend of 16/17 February, has been drastically changed. At the time of writing no official notification had been received

from ARRL, but it is understood that scoring will be similar to that in the CQ WW DX contests with special incentive to work into the USA and Canada.

The CQ WW DX 160 Contest
2200 25 January to 1600 27 January.
CW only. Exchanges consist of RST and serial QSO number (from 001). Contacts with own country count two points and with others five. QSOs with the USA and Canada count 10 points. The multiplier is the number of USA states, Canadian provinces and DXCC countries worked added together, but please note that W or VE does not also count as a country if a state or province is worked. Logs must be posted before 28 February and sent to CQ 160 Contest, 76 North Broadway, Hicksville, NY, 11801, USA.

The 1980 French Contest
0000 26 January to 2400 27 January (CW).
0000 23 February to 2400 24 February (Phone).
Single operators may only operate for 36 hours. Exchanges consist of RS/T plus serial QSO number (from 001). Contacts should be made with the Francophone countries—the 95 departments of metropolitan France, DA1 and DA2 stations using /FFA (French forces in Germany), and French overseas territories. Note that other countries previously listed by REF (for example, HB and ON) do not appear in the multiplier list in the 1980 rules. Contacts within one's own continent count three points, and 10 points outside it. The multiplier is one point (per band) for each "unit" of the areas already mentioned plus the following: FB8W, FB8X, FB8Y, FB8Z, FG, FG (St Martin), FG (St Barthélemy), FH, FK, FK (Loyalty Is), FK (Chesterfield Is), FM, FO (Iles-du-Vent), FO (Iles-sous-le-Vent), FO (Marquesas), FO (Gambier), FO (Rapa), FO (Iles Australes), FO (Tuamotu), FO (Clipperton), FP, FR, FR/E, FR/G, FR/J, FR/T, FW, FY and YJ. Final score is total QSO points multiplied by the sum of multipliers from all bands. Send logs and summary sheet (with multiplier list for each band) to REF French Contest, Sq Trudaine 2, 75009 Paris, France.

The PACC Contest
1400 9 February to 1700 10 February.
1·8 to 28MHz cw and ssb (no cross-mode), adhering to IARU band plans. There are single- and multi-operator and listener sections. Exchanges consist of RS/T plus serial number (from 001). Netherlands stations will indicate their province by giving two letters: GR, FR, DR, OV, GD, UT, YP, NH, ZH, ZL, NB and LB. Each contact with PA/PE/PI counts one point, and a station may be worked on each band for credit but only once on each band (not on both modes). Listeners score one point for each Netherlands station heard and should log the code group sent and the station with whom the contact was being made. The multiplier is the same as for the transmitting section. Send a summary sheet with logs and indicate new multipliers as worked/heard, and it is important to enclose a signed declaration that contest rules have been observed. Please send no later than 30 March to D. J. Hoogma, PA0DIN, Schoutstraat 15, 6525 XR Nymegen, Netherlands.

G4HLN has kindly sent the following details of British scores in the **1978 OK DX Contest:** (Single-operator all-bands) G3MZV (40,800), G3ESF (34,515), G6NK (4,384) and GW4FXF (3,354). On 14MHz G4HLN scored 810, and G3XFW 480, while on 28MHz GW3SLA was the sole representative with 494 points.

The **"Dialtwiddlers' Club of Firenze"** has submitted rules of its first QRP Championship. Rules are a little complicated and copies will be sent to those interested in exchange for an sase to G3FKM, or may be obtained direct from I5WUO, Leonardo Boselli, V.D. Comparetti 26, I-50135 Firenze, Italy. This club also issues a Milliwatt Award.

In the **1979 H26 Contest** UK scores were as follows: **G4FDC** (13,050), G3ESF (12,690), G3SNN (8,241), **GW3INW** (5,445), G3XFW (3,870), G4CVZ (3,600), G4EOW (3,306), G8PR (2,958), **GD4GWQ** (1,440), **GM4FSA** (780) and **GI4GDV** (612). Those listed in bold type received certificates.

Yugoslav 80 Metre CW Contest
2100 12 January to 2100 13 January.
Single- and multi-operator sections. Exchange RST plus serial number (from 001). QSOs with own country count one point, with same continent two, and with other continents five points. QSOs with YU count 10 points. The multiplier is the number of DXCC countries and YU prefixes worked. Include summary sheet and signed declaration, and check carefully (and remove) duplicates. Post before 1 March to YU DX Club of SRJ, PO Box 48, 11001 Belgrade, Yugoslavia.

In the **1979 CQ WW 160m Contest,** UK scores were as follows: GD4BEG (110,935), G3SZA (95,152), GU5CIA (53,792), G3XWZ/A (28,320), G3XTT (17,082), GW4CZK (13,300), G3IGW (9,367), G4BUO (6,426) and GW3GWX (2,453). In the multi-operator category GM4GRC was top world scorer with 98,200 points, and GU3HFN scored 12,008 points. GD4BEG, G3SZA and GU5CIA came world third, fourth and sixth respectively in the single-operator class.

Awards

Please note that the Society has a new honorary hf awards manager. Peter Miles, G3KDB, took over from Chas Emary, G5GH, on 1 January, and all applications for Society awards and requests for certification of overseas award applications (for which purpose the sponsors request checking by the awards manager of an IARU society) should now be sent to Peter at PO Box 73, Lichfield, Staffs.

Amsterdam DX Certificate
This is awarded for contacts with members of the Amsterdam DX Club—European applicants must work 15, others 10 members or that number which will total 70,000km of "QSO distance". Details of log entries (certified by two other amateurs) plus USA $5, or equivalent, to PA0RCA, PO Box 9 1000 Amsterdam, Netherlands. All profits from the issue of this award will be sent to the World Wildlife Fund.

Band reports

G8KG's report this month is a little longer, but contains much interesting information. It reads as follows: "The early deadline for this issue meant that these comments had to be prepared before even the preliminary solar data for the last few days of November were available, but there is still a good deal that can be said. At the start of the month the daily solar flux had always been above 195, and mostly above 250 sfu, since mid-September, with the highest daily values just reaching 240 sfu. Between 5 and 15 November the passage of a particularly active region of the sun resulted in a very sharp peak in activity with nine days above 250, four above 300, and a high of 383 sfu on 10 November. It is interesting to note that the latter value equalled the highest daily figure recorded in the 1957-8 solar

maximum (Cycle 19), but WWV reported it as 'flare enhanced', and it may well be reduced when the final figures are published—but could still be above 350 sfu.

"As sometimes happens, this high peak was followed by a fall in solar flux below the average level of recent months but, at the time of writing, this seemed likely to level off at about 170 sfu before rising again early in December. With some data still to come it looks as if the monthly mean flux for November will be at least 230 sfu, the highest so far in Cycle 21. It must also be remembered that a month is an arbitrary figure as far as the sun is concerned. The most active 27-day period so far was from 23 October to 18 November, for which the mean was just over 250 sfu and the range 205–383 sfu. It is more difficult from preliminary data to predict the most likely provisional Zurich sunspot number for November, but it will probably turn out to be between 180 and 190, in which case the three-month peak centred on October will be close to 185. This is above the peak of Cycle 18 and not all that short of Cycle 19 at the corresponding point (see *Radio Communication* September 1979, p834, Fig 1) but these relativities are subject to confirmation when the final Zurich numbers are published early in 1980.

"A question often heard these days is, 'Have we passed the peak?', to which there can only be one answer—'Let's wait and see!' From the statistics of past cycles we can reasonably expect to see a few months with the highest daily flux above 300 sfu, and high peaks are possible for at least the next 12 months, but only time will tell.

"Generally speaking the high solar activity was reflected in some remarkable conditions on the higher hf bands (of which the 50MHz band is very much to be regarded as a temporary member at present!), and F-layer mufs at least as high as 56MHz have been observed. With such high activity there were bound to be some magnetically disturbed days, but others were very quiet and gave excellent conditions. For those who were looking forward to the CQ WW CW Contest under near-peak conditions it was sad that the weekend was marred by magnetic disturbance, particularly since the previous weekend was outstanding!"

Thanks are due to the following who submitted information for this section. Gs, 2QY, 2AMV, 2HKU, 3HB, 3AAE, 3GIQ, 3GVV, 3IMW, 3KSH, 3LOL, 3XBY, 4EAN, 4EHQ, 4HLN, 5HJ, 5JL, 5MP, 6GH, BRSs 17567, 31301, 36928, 38934, and 42876.

Stations using cw are listed in italics.

1·8MHz. 2100 *LZ1CY/MM.* **2300** *VF6VAG.*

3·5MHz. 0100 8Z4A. **0600** *CN8AD* (QSL to F8JL), W0MJ. **0700** *HP1OXJ, VP2MDD,* W6KUT, W6NLZ, *ZL.* **0800** *N6VF, PJ2CC.* **2200** U0Y.

7MHz. 0500 *G6ZY/CN.* **0700** *KL7MF, VP2SX.* **0800** *HH2MC,* VK, *W6-W7.* **2300** *VU2BX, ZB2EO, 8Z4A.*

14MHz. 0000 EP2TT, HS1WR, VU, *3C1AC* (QSL to EA7LL). **0100** 9N1MM. **0500** ZK1CY. **0700** T3KA, VK0PK. **0800** C21AA, KL7, T3LA, ZL. **0900** W6-W7. **1000** HH2T, **KH6. 1700** AP5HQ, JT1AN, ZK2VE, ZL, 3B8FA. **1800** SU1ER, T4GN, *DF2ZC/3A.* **1900** KH6WU, *KL7MF.* **2000** *CE0XA* (QSL to PY1MAG), *P29EJ,* TZ4AQS, VK9CCT. **2100** HM1EJ, ZS2MI, 8Z4A. **2200** HH2MC, HZ1TC, J3AAE, TA1SU, VP2SAA (QSL to W4UG). **2300** HS4AMA, *U0Y,* 9Y4W, 9M6MU.

21MHz; 0000 HS4AMA, W1-W0, 8Z4A. **0100** KG6SW, S2BTF. **0700** ZL. **0800** *FC0FHK* (QSL to DL1RK), JA, KL, VK, ZL, 8Z4A. **0900** N4HX/TT8. **1000** H44WH, KL7, *VP2VDH.* **1200** U0Y. **1400** JA7JT/JD1. **1700** KH6BB. **1800** D68AM, FH8CL, HC8GI, KH6GB/KH9, UK1PAA. **1900** AH8A, KH6 (L.P), KX6PP, VR6TC. **2000** OK3TAB/D2A, W6, XT2AZ. **2100** TN8AJ, VP8SB, 6O4LS. **2200** W6-W7. **2300** W6, *4U1UN.*

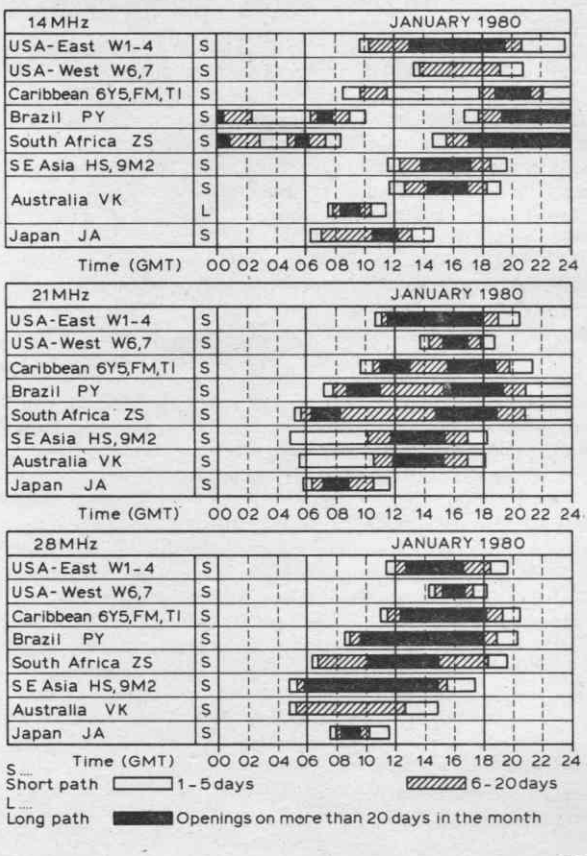
28MHz. 0500 JA. **0800** HM4SF, JA, KL7, VK, *ZB2CW* (QSL to G3LIK), ZL. **0900** JA, *JA7JT/JD1,* YJ8PD, 8Z4A. **1000** H44CB, N4ADJ/KH2, KL7, UA0, ZL. **1100** H44PT, JW2CF, KL7PJ, P29s, MF, NBF, U0Y, W5NUT/PJ7, YJ8NEM, 3D2WR. **1200** G4HPK/A6, A7XA, SU1BA, TR8CR, VK, 7X2DG. **1300** VP5WJR, 8Z4A. **1400** OK3TAB/D2A, *FR0MM,* HK0BKX, W6-W7, VE1AI/1 (Sable Is). **1500** YS9RVE, 4U1ITU. **1600** *LU7X* (Staten Is, QSL to LU6EF), ZF2BB. **1700** C5AAP, ZK1DR. **1800** KH6PP, VE6-VE8, 3B9RS. **1900** KH6BOG, *VP2SAX.* **2000** W4SS/C6A, KL7BV, VP1RX. **2100** W8-W0.

Your scribe wishes to thank all correspondents and also the writers of the following for news extracted: *Long Skip* **(VE3FRA),** *DX'press* **(PA0TO),** *CQ Magazine* **(W1WY),** the *Ex-G Radio Club Magazine* **(W3HQO),** *DX Bulletin* **(K1TN),** the *Long Island DX Bulletin* **(W4UL/W2IYX),** and *DX News Sheet* **(Geoff Watts).**

Please send all your news items to reach G3FKM by the following dates during 1980: for **March** issue by **1 February, April** by **7 March, May** by **1 April, June** by **30 April, July** by **30 May, August** by **27 June, September** by **25 July, October** by **5 September, November** by **3 October,** and **December** by **31 October.** □

Propagation predictions

Conditions in January will differ little from those of the previous month. Towards the end of the month the hf bands will remain open a little longer than at the moment. Otherwise conditions will be much the same as given for each band in December. It is again pointed out that all times are given in gmt; this is done to facilitate conversion into local time of various dx countries such as east and west USA, Asia and Australia.



microwaves

Charles Suckling, G3WDG *

A new beacon for 1·3GHz

The Martlesham Heath RS has recently commissioned its 1·3GHz beacon, GB3BPO. It is sited at the Post Office Research Centre (QTH locator AM77j), and its frequency is 1,296·83MHz. The transmitter produces 20W of rf at the antennas, which are currently a pair of 15/15 Yagis beaming east and west. It is intended to replace these in the near future with a slotted waveguide antenna, which will give better all-round coverage.

The coverage of the beacon is expected to be quite large in view of its relatively high erp. It has already been heard in Herne Bay by G3DAH, and in Northampton (indoors!) by G3WDG. Further reception reports would be welcomed by G4FSG.

A high-Q wavemeter for 24GHz

A self-calibrating wavemeter is described in the *VHF/UHF Manual* (p8.45). This is a rather low-Q device, and while very useful for finding the band without recourse to any other test equipment, suffers from the disadvantage that precise frequency setting is very difficult.

The writer has been fortunate in acquiring a surplus high-Q wavemeter covering 24GHz, mechanical details of which are shown in Fig 3. The device is a resonant cavity, tuned by a micrometer-driven plunger, coupled to the waveguide through a small hole. The main body of the wavemeter is made from copper, but brass would probably be satisfactory. Other constructional details should be apparent from the drawings. Access to both a lathe and a milling machine will be necessary to duplicate the wavemeter.

The micrometer used in the writer's wavemeter was a Moore & Wright instrument (0–25mm). If this type is not available, modifications could be made to the cavity body to allow the fitting of another type, but care should be taken that the resonant length of the cavity can be reached with the particular micrometer used.

The wavemeter body is clamped to the waveguide after removing the broad wall of the WG20 so that the wavemeter body itself forms the wall of the waveguide.

The original wavemeter suffered from the weakness that the plunger was only held to the micrometer shaft by virtue of its being a push fit on the shaft. It was difficult to ensure that the plunger was exactly coaxial with the cavity, with the result that the plunger would touch the side of the cavity at various points, leading to erratic readings. It was found better to fix the plunger to the shaft with Araldite. When the glue was fully cured, the micrometer was held in the lathe, and the final turning of the plunger carried out. Only very light cuts were taken to avoid breaking the epoxy. In this manner exact alignment was assured and no further problems were encountered.

The wavemeter has to be calibrated before it is of use, and access must be available to a known instrument. To this end it is intended to have calibration facilities for 24GHz available at future microwave round table meetings. The writer would also be prepared to calibrate wavemeters for those who cannot attend these meetings.

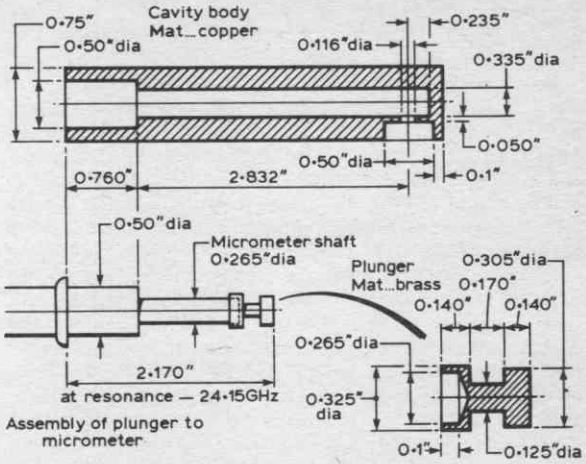


Fig 1. A high-Q wavemaster for 24GHz

A new microwave award

Some time ago the intention of the Microwave Committee to introduce a new microwave award was mentioned in this column. The writer is pleased to announce that the certificates and stickers have now been printed, and that the award is open for claims.

It is not intended that the new award should supersede the existing microwave distance awards, details of which were given last month. The new award is designed more to recognize regular activity on the microwave bands. It will operate under the following set of rules:

1. The award is available to RSGB members operating in or outside the UK.

2. It will be issued on receipt of QSL cards to confirm contacts, or reception reports in the case of listener awards, with stations in 5, 10, 15, 20, 25 etc QTH squares (ZL, AM etc) on the 1·3, 2·3, 3·4, 5·6, 10 or 24GHz bands.

3. On receipt of the first claim from a station, the vhf awards manager will issue the certificate together with the appropriate sticker(s). Further claims from the same station will involve submitting **all** the cards for the new category, eg 10 cards for a 10-square award, not just the new five. The new sticker will then be issued.

4. For each certificate awarded, operation must be from **one** site only. For portable stations, a "site" is defined as anywhere within 5km of a fixed point. Fixed stations must operate from their home QTH only. Further certificates can be claimed for operation from other sites.

5. Claimants must mark clearly their own QTH on each card submitted. This may be on the reverse side of the card, if desired.

6. The award will be retrospective, ie existing contacts (or reception reports) will count for the award.

7. Each claim must be accompanied by a claim form, available from the vhf awards manager. □

*31 Oakwood Road, Chandler's Ford, Hants SO5 1LW.

HF propagation study

Predicted hpf+luf in megahertz for January 1980

	00	02	04	06	08	10	12	14	16	18	20	22
Suva (s)	1800	1900	2000	1900	1800	3400	4100	3600	2700	1400	1400	1700
Wellington (s)	1500	1700	1700	1500	3100	3100	3200	2900	2400	1500	1300	1500
Osaka	1309	1610	1610	1410	3311	3110	2009	1408	1408	1308	1308	1509
Hongkong	1008	1109	1211	1714	4014	3712	3209	2205	1803	1604	1305	1206
Sydney (s)	1012	1115	1216	1717	3516	3212	3207	3203	2802	1704	1307	1210
Moscow	1003	1002	1002	1103	3004	4105	4205	4004	2902	1802	1203	1103
Bangkok	1207	1309	1212	2214	4815	4613	4610	4506	3103	1904	1305	1306
Singapore	1307	1409	1212	2415	4416	4514	4211	3906	3202	2003	1404	1405
New Delhi	1303	1405	1207	2410	4612	4411	4109	3405	2502	1502	1403	1403
Perth	1410	1413	1415	2718	3620	3518	3213	3207	3203	2203	1405	1408
Teheran	1503	1502	1403	2706	5109	5109	4808	4605	3302	2102	1403	1503
Colombo	1504	1507	1410	2713	4615	4715	4513	4008	3404	2303	1504	1504
Bahrain	1603	1503	1404	2707	4910	4711	4610	4406	3502	2402	1503	1603
Cyprus	1603	1502	1402	2205	4507	4709	4508	4405	3602	2502	1503	1504
Aden	1904	1705	1706	2710	5013	4914	4513	4207	3803	2803	2004	1804
Seychelles	2000	1800	1700	2700	4400	4400	4300	4100	3600	2900	2200	2000
Mauritius	2200	1900	1800	2700	4000	4000	4000	3700	3700	2900	2300	2100
Nairobi	2303	1903	1805	2408	4812	4814	4613	4408	4004	3103	2403	2203
Malta	1403	1302	1202	1204	2905	3807	3707	3706	3304	2304	1503	1403
Salisbury	2503	2203	1805	2209	3713	4214	4414	4211	4107	3304	2703	2502
Cape Town	2700	2400	1900	1800	3700	4000	4000	3900	3800	3500	2900	2700
Lagos	2604	2503	1903	1706	3910	4612	4613	4212	4210	3606	3004	2803
Suva (l)	2700	2600	2000	1700	3000	3000	2900	2400	2300	2700	3000	2800
Gibraltar	1302	1202	1102	0902	1903	3204	3304	3204	3003	2402	1702	1402
Ascension	2604	2503	2003	1606	3210	4613	4615	4216	4214	3909	3104	2804
Wellington (l)	2400	2500	2000	1500	2600	2600	2300	2100	2100	2500	2500	2600
Dakar	2605	2504	2004	1606	3210	4612	4614	4214	4212	3908	3105	2805
Las Palmas	2003	2003	1602	1302	2303	4305	4608	4208	4107	3505	2703	2203
Falklands	2407	2405	2005	1507	2412	3617	3721	3822	4021	4017	3113	2809
Rio de Janeiro	2405	2404	2004	1506	2309	4413	4617	4418	4417	4014	3110	2807
Buenos Aires	2305	2404	2004	1504	2106	3812	4217	4419	4418	4115	3112	2808
Sydney (l)	2215	2214	1811	1509	1708	2812	2717	2321	2023	2222	2619	2717
Lima	2200	2200	1800	1500	1600	2100	4600	4800	4600	4300	3300	2700
Barbados	2103	2002	1702	1500	1602	2307	4712	4614	4214	4211	3407	2605
Bogota	2100	2000	1600	1500	1500	1700	4500	5100	4200	4100	3400	2500
Jamaica	1900	1800	1500	1600	1500	1700	3600	4800	4700	4300	3100	2400
Bermuda	1900	1900	1500	1600	1600	1700	4100	5100	5100	4400	3100	2400
New York	1806	1806	1506	1605	1605	1707	3209	4811	5111	4110	2808	2207
Mexico	1800	1800	1500	1600	1600	1600	1600	4300	4800	4100	2700	2200
Montreal	1808	1808	1508	1608	1608	1709	3211	4812	5113	4011	2609	2209
Denver	1800	1700	1600	1700	1700	1700	1700	2900	4600	3600	2400	1900
Los Angeles	1800	1700	1900	1700	1600	1500	1500	1700	4100	3500	2200	1900
Vancouver	1800	1700	1800	1900	1700	1700	1600	1600	2400	2800	1700	1700
Iceland	1008	1108	1008	1007	1107	2407	3607	3608	3207	1908	1208	1108
Honolulu	1800	1800	1900	1900	1800	1500	1400	1300	1200	2300	1600	1700
Fairbanks	1800	1800	2000	2000	1800	2100	1900	1800	1900	2000	1500	1700

First two digits are hpf, last two luf. LUF 00 indicates data not available.

Contests calendar

October 1979–January 1980	432MHz Cumulative *(Rules in September 1979 issue)*
November 1979–January 1980	1,296MHz Cumulative *(Rules in September 1979 issue)*
6, 12, 20, 26 January	3·5MHz Cumulative *(Rules in December 1979 issue)*
7, 15, 23, 31 January	1·8MHz Cumulative *(Rules in December 1979 issue)*
12–13 January	Yugoslavia 80m CW *(Rules in January issue)*
13 January	AFS *(Rules in December 1979 issue)*
20 January	70MHz CW *(Rules in December 1979 issue)*
25–27 January	CQ WW DX 160 *(Rules in January issue)*
26–27 January	REF CW *(Rules in January issue)*
2–3 February	7MHz Phone *(Rules in June and July 1979 issues)*
3 February	432MHz Fixed *(Rules in January issue)*
9–10 February	First 1·8MHz *(Rules in January issue)*
9–10 February	PACC *(Rules in January issue)*
10–16 February	BATC Activity Week and Television *(Rules in December 1979 issue)*
16–17 February	ARRL DX CW
23–24 February	7MHz CW *(Rules in June and July 1979 issues)*
23–24 February	REF Phone *(Rules in January issue)*
1–2 March	144/432MHz and SWL *(Rules in January issue)*
1–2 March	ARRL DX Phone
8–9 March	Commonwealth *(Rules in December 1979 issue)*
22–24 March	BARTG Spring RTTY *(Rules in December 1979 issue)*
29–30 March	CQ WW WPX SSB
12 April	1,296MHz Trophy
13 April	Low Power
13 April	432MHz Trophy and SWL
3–4 May	144/432/1,296MHz and SWL
4 May	Regional Round-up CW
18 May	Regional Round-up Phone
24–25 May	CQ WW WPX CW
25 May	144MHz Low Power
1 June	70MHz and SWL
7–8 June	NFD
28–29 June	Summer 1·8MHz
5–6 July	VHF NFD
20 July	3·5MHz Field Day
3 August	144MHz QRP and SWL
11–12 August	Meteor Scatter
17 August	70MHz Trophy and SWL
6–7 September	SSB Field Day
6–7 September	144MHz Trophy and SWL
4–5 October	432/1,296/2,304MHz and SWL
12 October	21/28MHz
19 October	21MHz CW
19 October	70MHz Fixed
November–December	432/1,296MHz Cumulative
2 November	144MHz CW
8–9 November	Second 1·8MHz
7 December	144MHz Fixed

Mobile rallies calendar

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

30 March—White Rose Rally, Lawnswood School, Leeds 16. Details from G4DZI.
20 April—Southend & District Mobile Rally, De Havilland Suite, Southend Airport Museum, Aviation Way, Southend-on-Sea, Essex. Details from F. Thorogood, G8ORV, 30 Grange Gardens, Southend-on-Sea, Essex. More details later.
20 April—Welsh Amateur Mobile Rally, Barry Memorial Hall. Further details from K. B. Hodge, 16 Claude Road West, Barry, S Glam.
27 April—North Midlands Mobile Rally, Drayton Manor Park, Tamworth, Staffs. Further details from G8BHE, tel 021-422 9787.
25 May—Plymouth Radio Club Rally, Tamar Secondary School, Plymouth, Devon. Further details from G4GWJ, QTHR.
1 June—Hull & D ARS Mobile Rally, Hull University. Would traders please contact G8EAH, QTHR, for details of discounts for advanced booking. Further details nearer the date.
1 June—Brighton Racecourse Amateur Radio Rally, Kemptown Racecourse, Brighton, Sussex. Further details from G8JFT, tel 0273 697682.
1 June—East Anglia Radio Amateurs Picnic, East Anglian Transport Museum, Nr Lowestoft. Further details from G3TWQ, QTHR.
8 June—Elvaston Castle Mobile Rally, Nunsfield House, Alveston, Derby. Further details from G4CTZ, tel Derby 71875.
15 June—RNARS Mobile Rally, HMS *Mercury*. 10am to 5pm. All usual trade stands and many attractions for the family. Further details from Wally, G4DIU, QTHR.
13 July—Upton Mobile Rally, Upton-on-Severn, Worcs.
13 July—Knowsley Park Mobile Rally and Convention, Knowsley Park, Liverpool. Further details from G3LEQ, tel 0565 4040.
20 July—Cornish RAC Mobile Rally, Truro, Cornwall. Further details from G8JML, tel Truro 78020.
3 August—RSGB National Mobile Rally, Woburn Abbey. Details from N. Miller, G3MVV.

Looking ahead

12 January—RSGB Presidential Installation. On board mv *Mayflower Garden,* sailing from Westminster Pier promptly at 7.30pm.
8 March—RSGB National VHF Convention, The Winning Post, Twickenham, Middx.
11 and 12 April—RSGB Lectures, "Amateur radio—making a start", Science Museum, London, at 3pm on the Friday, and 11am and 3pm on the Saturday.
27 April—South East Raynet Symposium, Crawley, Sussex.
27 April—Northern Radio Societies Association Radio & Electronics Exhibition, Belle Vue, Manchester.
9–10 May—RSGB National Amateur Radio Exhibition, Alexandra Palace, London.
28–29 June—Jersey Radio Convention. Details from GJ4ICD, tel 0534 26788.

council proceedings

A brief report on the Council meeting held on 15 September 1979

Present: Mr J. Bazley (President, in the chair), Dr E. J. Allaway, Messrs D. H. Adams, J. Anthony, R. Bellerby, P. F. D. Cornish, T. P. Douglas, Dr D. S. Evans, Messrs L. N. G. Hawkyard, W. F. McGonigle, B. O'Brien, G. M. C. Stone (members of Council), D. A. Evans (general manager) and A. W. Hutchinson (editor).

Apologies were received from Messrs D. J. Andrews, G3MXJ; G. I. Knight, GM8FFX; C. H. Parsons, GW8NP; R. F. Stevens, G2BVN; and C. J. Thomas, G3PSM.

General manager's report
This dealt with *DX News Sheet* subscriptions and despatch; headquarters reception area and staff; Leicester exhibition arrangements, and QSL cards.

A short discussion took place on the possible effects on RSGB membership if a citizens' band was licensed in the UK.

Financial report
The hon treasurer circulated various documents relating to the annual report and accounts, and commented in detail on some of their contents. He explained the reasons for the revised format which would enable members to appreciate fully the amount of money spent on amateur radio matters. The new format was welcomed by Council.

Mr Cornish dealt with various questions raised, and he was thanked for his work in producing the accounts.

Committee minutes and business

Education (23.6.79)
RAE instructors had been invited to attend a meeting of the committee at the Leicester exhibition.

HF (14.6.79, 1.9.79)
Mr Bazley reported that a number of letters had been received regretting the cancellation of the hf convention and asking for another to be organized. A recommendation that the Rotab Trophy be awarded to G3KMA was approved.

HF Contests (24.7.79)
Accepted without comment.

IARU (26.7.79)
Region 1 had circulated documents to national societies regarding the venue for the next Region 1 conference, but no conclusion had yet been reached.

Interference (10.8.79)
Accepted without comment.

Membership & Representation (14.7.79)
Accepted without comment.

Microwave (21.7.79)
Accepted without comment.

Mobile & Exhibition (31.7.79)
The 1980 Woburn Rally would take place on 3 August.
Next year's Alexandra Palace exhibition was discussed.

Raynet (14.7.79)
The appointment of Mr Bellerby to the committee was approved.

Finance & Staff
A discussion on the qualifications of student members took place. It was agreed that a questionnaire be sent to educational establishments affiliated to the Society so that a basis for discussion could be provided.

Technical & Publications
Dr Evans reported on sales of the *Amateur Radio Operating Manual* and the *RAE Manual*, for which there was a growing demand.

Dr Evans spoke of the need for constructional articles, and gave details of a crystal calibrator which had been designed, and for which a limited number of kits of parts had been assembled. The possibility of marketing kits after publication of the article should be considered. After discussion Council agreed to a limited marketing experiment after publication of the article.

Membership and representation
Council noted and approved that:
(i) subscriptions had been reduced in respect of two members;
(ii) subscriptions had been waived in respect of four members.

Mr F. Hall, RR12, had reported that Mr I. Coulson, AR for Tayside, was unable to carry out AR duties because of ill-health.

Awards
Mr Cornish said he had been considering various awards and donations offered to the Society in recent months, and had come to the conclusion that a broader approach was necessary. He outlined certain ideas and said he would go further into details and report back to Council.

Intruder Watch
The President read a letter from the Intruder Watch Organizer, Mr S. Cook, G5XB, in which he stated that on medical advice he had to give up this appointment. Council accepted this with regret and recorded its appreciation of his work over many years.

London repeater system
Dr Evans said that the Home Office had given final approval of the London repeater system, and it was hoped that it would be possible to activate the four repeaters by the end of the year.

Press reports
Mr Stone reported that the South London Press had published a letter from a local councillor saying that the RSGB had a deep-rooted objection to citizens' band. It was agreed that Mr Stone and the general manager write to the newspaper to set the record straight.

obituaries

The Society records with regret the deaths of the following radio amateurs:

Mr A. W. Alliston, ex-G5LA
Archie Alliston, who died on 3 November 1979, aged 87, joined the Society before the second world war, and became a Council member and honorary advertising manager in the time of Horace Freeman, travelling the kingdom to persuade companies to support the *"Bull" (RSGB Bulletin,* the former title of *Radio Communication*). He was very active on the hf bands and was instrumental in getting the late Nelly Corry, G2YL, interested in amateur radio, coaching her for her licence.

Mr P. S. M. Carnochan, G3IAO
"Pete" Carnochan, who died on 30 September 1979, aged 57, was a founder member of the Lowestoft ARC. His interest in amateur radio developed during his service in the RAF as an airgunner/radio operator in the second world war.

Mr G. A. O. Ross, GM3YXU
Graham Ross, who died on 7 November 1979, aged 69, obtained his licence while living in Guildford, shortly before he retired to Kincraig, Inverness-shire. He was a popular personality on the 3·5 and 7MHz bands. His hospitality to visiting amateurs was renowned, and to many amateurs GM3YXU and Kincraig were synonymous.

Mr R. S. Scales, G3NRS
Stan Scales died on 30 October 1979. He was a past-president of Scarborough ARS, and an accomplished organist, and was active in both spheres until shortly before his death.

We have also been advised of the deaths of:

Mr D. Cliff, G3UQV;
Mr J. A. Doremus, W0AW, on 16 May 1979; and
Mr E. Lowe, ZS6DY/ZS5A.

raynet

M.G. Barker, G8CAC*

In this, the first *Raynet* column of 1980, it falls to me as chairman to wish all Raynet members, on behalf of the Raynet Committee and myself, belated compliments of the season. We hope that the Christmas festivity period was not interrupted with bad weather and that members were not called away to leave their families at that festive time. The committee also wishes me to thank all members for their good work and support during 1979. The past year has been an extremely active one for Raynet (see chairman's report, *Radio Communication,* November) and as this new year starts we can but wonder what the future will bring. Perhaps I should repeat the comment I made at this time last year and ask if all members have checked their vehicles, rigs and recommended contents, as now could be the time when we could be called upon for help, and we do not want to waste time looking for maps, message pads, pens and pencils. These items do not take up much room, as they can all fit into a folder and stow neatly in the back of a car or under the back seat—as long as one remembers where they are.

Raynet Committee

This year will bring a few changes to the committee. Jane Balestrini, the supplies officer, has told the committee that she would like to stand down from the committee as from this month. We are all very sorry to see Jane go; she has been invaluable to the committee—always able to put forward a non-amateur point of view and yet be completely dedicated to Raynet and its furtherance. Her remarkable memory, which has helped us countless times, will be sadly missed at meetings—as will her refreshments. May I take this opportunity to thank Jane in print for all the past years she has given to Raynet—and may I express the wish that we can continue to count on her services as supplies officer for many years to come. Peter Balestrini, G3BPT, is the RSGB President this year, and as such will be heavily involved in Society activities for the period he will be in office. However, I know he will still give Raynet as much time as he possibly can. Bob Bullard, G8MNW, has tendered his resignation to the committee, which the committee has regretfully accepted. Until the first committee meeting this year, committee appointments cannot be finalized.

Raynet Manual

The committee is making steady progess up-dating and reviewing and, in some cases, completely re-writing whole sections of the *Raynet Manual.* It is hoped that this will be available either for the RSGB Alexandra Palace Exhibition, or, more probably, the Woburn Rally. The committee is also redesigning the registration form which, in future, will have more information on it. Part of the completed form will be retained by the registration secretary, Taff, so that she will not have to type the information on to record cards as at present, and thus lighten some of her workload. With some 2,500 members' records to be up-dated annually, it is no small job, and we publicly thank Taff for all her good work.

Raynet gatherings

The first get-together for this year is now well past the planning stage. It will be held on Sunday 27 April at Crawley, Sussex, hosted by the Sussex Raynet groups. Further information from J. M. Houlihan, G4BLJ. The Raynet Committee is waiting to hear who will be taking up the challenge to run the second event this year; hopefully it will be a more northerly meeting so that all of our friends north of Watford will get the chance to attend.

The future

The Home Office has given us permission to operate from small vessels up to a two-mile seaward limit during a genuine sea pollution situation. I think that most of the Raynet Committee and I feel that this remit should be further extended to cover at least one sea pollution exercise per year for those groups directly involved. This would ensure that any unforeseen operating problems could be sorted out before it is the real thing. We also would like, even if only for an experimental period, to be able to use "talk-through" during properly constituted exercises. This would save untold delay and the possibility of errors occurring during the operation of relay stations, as happens at present. □

*3 Burley Close, Desford, Leicester LE9 9HX.

Cornwall Raynet Group open day and symposium

Having completed the installation of the new antennas on the roof of the county hall, and having also commissioned the vhf and uhf systems, the Cornwall Raynet Group held an open day and symposium at County Hall, Truro, on 22 September 1979, with the co-operation of the county emergency planning officer. Invitations were extended to the county council, Coastguard Service and the press, and a total of 60 people attended during the day. Many Raynet members were also present, among them the Raynet controller for south London, Cyril Cresswell, G3ZZY.

The symposium was attended by 48 Raynet members, and the principal speaker was Wing Commander R. F. Redding, MBE, deputy county emergency planning officer, who dealt with Raynet's role in war; Raynet's role in peace-time emergencies, and the aims and objects of the forthcoming RADPLOT 79 exercise. Many questions were dealt with during the following hour-and-a-half, and after the break the county controller, G3XC, introduced the district controllers.

The penultimate item on the agenda was "group activity". Discussion ranged from first-aid to finance, and at the end of the symposium a collection amounting to £13 was made.

Thanks are due to all who helped, and for the co-operation received from the staff of the county council.

Raynet members who attended the open day and symposium at Truro

General rules for vhf/uhf/shf contests 1980

The rules governing all RSGB vhf/uhf/shf contests to be held in 1980 will be selected from the following general rules, which will be referred to by number. Supplementary rules will be added for the more complex events such as VHF NFD.

Please read these rules carefully

Cover and summary sheets and up to 10 log sheets can be obtained from the contest adjudicator. If you are entering a contest it is only necessary to tick the bottom of the cover sheet (Form 427) and enclose an sae. All stationery is A4 size (30 by 21cm); envelopes which will hold flat sheets will carry far more than those which require the sheets to be folded. Larger quantities of log sheets may be purchased from RSGB Publications (Sales). Minor queries can be made to Roger Taylor, G4BEL, tel Ely 740355.

1. Date and time: see individual contest details.

2. All entries must be sent to the adjudicator at the address given with the rules for the contest.

3. All operators must be members of the RSGB or have a membership application in progress.

4. Sections:
(a) There are two sections:
Section S — Single operator fixed stations.*
Section M — All other stations.
(b) All classes of stations with no separate sections.
(c) Fixed stations only.
(d) Portable stations only.

*Stations operated by a single person, with no operating or log keeping assistance during the contest, and operated from the "main address" of the station.

All equipment, including antennas, for portable and temporary stations must be installed on the site during the 36 hours preceding the contest, or during the contest itself. This does not apply to storage of equipment, or to its prior installation more than 1km away from the contest operating position.

Portable stations may be required to provide proof of permission to use a site.

5. Locations:
(a) Entrants may not change the location of their stations during the contest.
(b) Entrants may change the location of their stations during the contest on one occasion provided that only the highest scoring contact with a given station is claimed in the event of a repeat contact. Repeat contacts must be clearly marked as such in the contest log.
(c) In multiband contests all stations forming one entry must operate from within a circle of 1km radius.

6. Modes:
(a) Contacts may be made on all permitted modes.
(b) Entrants may transmit only A1 (cw) or F1 (fsk) and contact only other stations transmitting these modes.

7. Scoring system:
(a) Contacts made between the distances shown in the table will score as indicated. Contacts on borders between scoring rings score *low*.

Km	Points	Km	Points
0–50	1	250–300	11
50–100	3	300–350	13
100–150	5	350–400	15
150–200	7	400–450	17
200–250	9	and pro rata	

Note that, (i) all radial rings are 50km wide, (ii) all possible scores are odd numbers.
(b) Contacts will be scored at one point/kilometre.

8. Awards. In each section there will be an award to the highest scoring station. An award will also be made to the runner-up in each section in which there are 10 or more entries. Additional awards will be made when appropriate.

9. Cross-band contacts:
(a) Cross-band contacts do not count for points.
(b) Half points may be claimed by both stations for a cross-band contact if two-way communication cannot be established on the same band.

10. Repeat contacts:
(a) Only one scoring contact may be made with a given station on each band covered by the contest (ie callsigns that are fixed, /A, /P or /M, or the same set of equipment used under a different callsign all count as one station). If a station that has moved location is contacted a second time, only the higher scoring contact may be claimed. Serial numbers start at 001 and advance by one for each contact.
(b) One contact may be made with a given station (as defined in 10a) during each activity period. Only three out of seven activity periods will count towards the final score. However, all available logs should be sent to the adjudicator for the purpose of checking. To be eligible for an award an entrant must take part in a minimum of three activity periods. Serial numbers start at 001 for each activity period and advance by one for each contact.

11. Contest exchange. The contest exchange shall consist of:
(a) Both callsigns, RS or RST report followed by serial number, both QTH locator (the standard five-symbol location system) and QTH.
(b) Both callsigns, RS or RST report followed by serial number, and QTH locator (the standard five-symbol location system).

For stations operating within Great Britain the QTH must be given as a point identifiable on the Ordnance Survey Route Planning Map (Scale 1:62,500) or as a direction and distance up to 25km from such a point, to the nearest kilometre. For a station operating from outside Great Britain, the QTH must be readily identifiable.

No points will be lost if an entrant is unable to obtain a serial number or complete location information from a station not taking part in the contest. But the receiving operator must obtain enough information to be able to calculate the claimed distance score.

12. Log keeping. Entrants must keep their own log records in accordance with licence requirements. The logs for contest entries must be made out on current RSGB contest log sheets or if computer readout sheets are to be submitted these must be cut to A4 size format.
(a) Date/time (gmt).
(b) Callsign of station worked.
(c) My report on his/her signals and serial number sent.
(d) His/her report on my signals and serial number received.
(e) QTH locator received.
(f) QTH received (where appropriate).
(g) Points claimed.

13. A station must operate within the terms of his/her licence.

14. A station may not engage in more than one contact concurrently.

15. Stations using telephony in the recognized cw sub-bands 70·025–70·15MHz, 144·0–144·15MHz, 432·0–432·15MHz and 1,296·0–1,296·15MHz, or transmitting on beacon frequencies, are liable to disqualification. Entrants should observe the provisions of the IARU/RSGB band plans.

16. Stations that persistently radiate poor quality signals, or otherwise contravene the code of practice for vhf/uhf contest operation (see p65), are liable to disqualification or loss of points.

17. Special event callsigns (eg GB) may not be used.

18. Contacts made via a repeater or man-made satellite or by moonbounce will not count for points.

19. Proof of contact may be required.

20. Entries:
(a) All entries must be accompanied by a *current* RSGB vhf/uhf contest cover sheet (Form 427) for each band used. The cover sheet must be correctly completed and the declaration signed. In multiband contests entrants must also complete a multiband summary sheet (Form 4422).
(b) All entries must be postmarked not more than 15 days after the end of the contest.
(c) All entries become the property of the RSGB and will not be returned.
(d) Gross errors in log keeping render the entrant liable to disqualification.

21. Failure to comply with any of the rules given for a particular contest may result in disqualification.

22. The ruling of the Council of the RSGB shall be final in all cases of dispute.

General rules for RSGB hf contests 1980

The general rules for all RSGB hf contests are given below. For each contest throughout the year a specific set of rules will be published which must be read in conjunction with the general rules.

1. Entrants must operate in accordance with the terms of their licences.

2. Only one contact on each band may be claimed with a specific station, whether fixed, portable, mobile or alternative address. Duplicate contacts must be logged and clearly marked as duplicates without claim for points. Proof of contact may be required.

3. Unless otherwise stated, only single-operator entries will be accepted. A single-operator station is one manned by an individual operator who receives no assistance whatsoever during the contest period.

4. When multi-operator entries are specifically allowed, such entries will be accepted only if:
(a) the declaration is signed by one operator, who will be regarded as the entrant, and
(b) the operator's callsign is given for each contact.

5. Operators of stations located within the British Isles, ie within the call areas G, GD, GI, GJ, GM, GU and GW, must be fully paid-up members of the RSGB.

6. A contact consists of an exchange and an acknowledgement of an RS report on telephony or of an RST report on telegraphy, and a three-figure serial number commencing with 001 and increasing by one for each successive contact throughout the contest period, irrespective of the band or mode in use. Serial numbers, when sent, must be recorded from non-competing stations.

7. Entries must be clearly written or typed on one side only of RSGB hf contest log sheets (Form HFC1) or international A4 size paper using blue or black ink. *Separate log sheets must be used for each band.* Logs must be kept and entries submitted in gmt.

8. Each entry must include a cover/summary sheet (eg Form HFC2) incorporating a signed declaration.

9. Entries must be addressed to the adjudicator, whose address will appear in the specific rules for each contest, with the name of the contest marked in the top left-hand corner. All entries must be postmarked not later than 15 days following the contest. If acknowledgement of receipt is required, British Isles entrants should include a stamped addressed postcard which will be returned to the sender. Overseas entries will not normally be acknowledged.

10. All entries become the property of the RSGB. In the event of any dispute, the ruling of the Council of the RSGB shall be final.

11. For scoring purposes, aeronautical mobile and maritime mobile stations will count only as the minimum score of the particular contest and not for any bonus or multiplier. Entries from GB stations, aeronautical mobile and maritime mobile stations will not be accepted.

12. Awards are made at the discretion of the Council of the RSGB and may consist of trophies, plaques or certificates. When possible, awards are presented at the RSGB AGM following the contest.

13. Certificates of merit are normally sent to the three leading stations in each section of a contest.

14. Entrants may be disqualified for failure to observe the general rules or the specific rules.

15. Points are deducted for errors in the logs. For unmarked duplicate contacts for which points have been claimed, additional penalty points may be deducted (eg five times the claimed score for the contact).

16. Small quantities of RSGB hf contest log sheets (Form HFC1) and cover/summary sheets (Form HFC2) may be obtained from RSGB HQ on receipt of a large stamped addressed envelope. Larger quantities may be purchased.

Code of practice for vhf/uhf contest operation

1. Obtain permission from the landowner or agent before using the site, and check that this permission includes right of access. Portable stations should observe the Country Code.
2. Take all possible steps to ensure that a site is not going to be used by some other group or club. If it is, come to an amicable agreement *before* the event. Groups are advised to select possible alternative sites.
3. *All transmitters* generate unwanted signals; it is the level of these signals that matters. In operation from a good site, levels of spurious radiation which may be acceptable from the home station may well be found excessive by nearby stations (up to 25 miles or even further).
4. Similarly, *all receivers* are prone to have spurious responses or to generate spurious signals in the presence of one or more strong signals, even if the incoming signals are of good quality. Such spurious responses may mislead an operator into believing that the incoming signal is at fault, when in fact the fault lies in his own receiver.
5. If at all possible, critically test both receiver and transmitter for these undesirable characteristics, preferably by air test with a near neighbour before the contest. In the case of transmitters, aim to keep all in-amateur-band spurious radiations, including noise modulation, to a level of −90dB relative to the wanted signal. Similarly, every effort should be made to ensure that the receiver has an adequate dynamic range.
6. Above all, be gentlemanly at all times. Be helpful and *inform all stations* apparently radiating unwanted signals at troublesome levels—having first checked your own receiver! If asked to close down by a government or Post Office official, do so at once without objectionable behaviour. If the site owner requests your station to close down, accede to his request without hostility.

General rules for RSGB hf receiving contests 1980

1. To claim points, a station may be logged once only on each band whether fixed, portable, mobile, or alternative address.

2. A receiving station log must show in columns: date/time (gmt), callsign of station heard, report and serial number sent by station heard, callsign of station being worked, bonus points, total points. The band in use must be shown at the top of each log sheet.

3. A cover/summary sheet (eg Form HFC2) must be submitted with the logs. The signed declaration must include the words "I certify that I do not hold a transmitting licence".

4. The following rules from the transmitting general rules also apply to receiving contests: 3,5,7,9,11,12,13,14,15 and 16.

General rules for listeners' vhf/uhf contests 1980

1. The following rules from the general rules for vhf/uhf contests published in this issue shall apply: 1, 2, 4b, 5a, 7a, 10a, 18, 20, 21, 22.
2. Listeners' contests are open to all non-licensed members of the RSGB. Only the entrant may operate the receiving station.
3. Logs must show in columns: (a) date/time (gmt), (b) callsign of station heard, (c) my report on his/her signals, (d) report and serial number sent by station heard, (e) callsign of station being worked, (f) QTH locator given by station heard, (g) QTH given by station heard (where appropriate), (h) points claimed.

On 144MHz the callsign in column (e) may occur only once in every 20 contacts logged. CQ and test calls do not count for points and should not be logged. If both sides of a QSO can be heard, both can be claimed for points.

The Hanson Trophy will be awarded to the entrants with the highest aggregate score in all the swl contests between 1 March and 7 September 1980.

Code letters for use in RSGB contests

County/Region	Letters	County/Region	Letters	County/Region	Letters	County/Region	Letters
Alderney	ALD	Durham	DHM	Isles of Scilly	IOS	Salop	SLP
Antrim	ATM	Dyfed	DFD	Isle of Wight	IOW	Sark	SRK
Armagh	ARM	Essex	ESX	Jersey	JER	Shetland	SLD
Avon	AVN	Fermanagh	FMH	Kent	KNT	Somerset	SOM
Bedfordshire	BFD	Fife	FFE	Lancashire	LNH	Staffordshire	SFD
Berkshire	BRK	Mid Glamorgan	GNM	Leicestershire	LEC	Strathclyde	SCD
Borders	BDS	South Glamorgan	GNS	Lincolnshire	LCN	Suffolk	SFK
Buckinghamshire	BKS	West Glamorgan	GNW	Greater London	LDN	Surrey	SRY
Cambridgeshire	CBE	Gloucestershire	GLR	Londonderry	LDR	East Sussex	SXE
Central	CTR	Grampian	GRN	Lothian	LTH	West Sussex	SXW
Cheshire	CHS	Guernsey	GUR	Greater Manchester	MCH	Tayside	TYS
Cleveland	CVE	Gwent	GWT	Merseyside	MSY	Tyne & Wear	TWR
Clwyd	CWD	Gwynedd	GDD	Norfolk	NOR	Tyrone	TYR
Cornwall	CNL	Hampshire	HPH	Northamptonshire	NHM	Warwickshire	WKS
Cumbria	CBA	Hereford & Worcester	HWR	Northumberland	NLD	Western Isles	WIL
Derbyshire	DYS	Hertfordshire	HFD	Nottinghamshire	NOT	West Midlands	WMD
Devon	DVN	Highlands	HLD	Orkney	OKE	Wiltshire	WLT
Dorset	DOR	Humberside	HBS	Oxfordshire	OFE	North Yorkshire	YSN
Down	DWN	Isle of Man	IOM	Powys	PWS	South Yorkshire	YSS
Dumfries & Galloway	DGL					West Yorkshire	YSW

contest news

First 1·8MHz Contest 1980 rules

1. Aim of contest. To encourage the use of the 1·8MHz band.
2. Eligible entrants. Single-operator stations only. British Isles entrants must also be members of RSGB.
3. Period. 2000gmt Saturday 9 February to 0100gmt Sunday 10 February 1980.
4. Sections
(a) British Isles stations.
(b) Overseas stations including EI.
5. Frequencies/mode. 1·8–2·0MHz cw (A1) only. British Isles stations should note that overseas stations may be allocated different parts of the band; eg Austria 1·823–1·838MHz, Netherlands 1·825–1·835MHz, USSR 1·850–1·950MHz.
6. Contest call and exchange. CQ test, RST plus serial number starting at 001. British Isles stations must also give their county code as published in this issue of *Radio Communication*.
7. Scoring
(a) British Isles section. Three points for each contact, with a bonus of five points for the first contact with each new British Isles county/region, and the first contact with each new country outside the British Isles.
(b) Overseas section. Three points for each contact with a station in the British Isles (not EI), with a bonus of five points for the first contact with each new county/region.
8. Logs. Log sheets to be headed: date/gmt; callsign; RST/number sent; RST/number received; code received; bonus; points.
9. Declaration. Each entry must be accompanied by the following declaration, signed and dated: "I declare that this station was operated strictly in accordance with the rules and spirit of the contest, and I agree that the decision of the Council of the RSGB shall be final in all cases of dispute".
10. Address for logs. RSGB HF Contests Committee, c/o D. S. Booty, 139 Petersfield Avenue, Staines, Middx TW18 1DH, England.
11. Closing date for logs. Logs must be postmarked no later than Monday 25 February 1980.
12. Awards
(a) The Somerset Trophy will be awarded to the winning station in the British Isles section, and certificates of merit to the second and third placed entrants. The Maitland Trophy will be awarded to the Scottish entrant with the highest aggregate number of points in this contest combined with the Second 1·8MHz Contest 1979.
(b) Certificates of merit will be sent to the first three entrants in section (b), and to the leading entrant in each overseas country.

144/432MHz and SWL Contest rules

1600–1600gmt* 1–2 March 1980

The following general rules, published in this issue of *Radio Communication*, will apply: 1, 2, 3, 5a, 5c, 6a, 7a, 8, 9a, 10a, 11–22.

There are four sections:
1. 144MHz, single-operator fixed.
2. 144MHz, all other stations.
3. 144/432MHz, single-operator fixed.
4. 144/432MHz, all other stations.

Note. Stations operating in section 4 may use separate callsigns for each band, and operate simultaneously.

*Single-operator stations, as defined in rule 4 of the general rules, must break for six consecutive hours.

All entries and check logs to: VHF Contests Committee, c/o Mr R. Taylor, G4BEL, 12 The Rampart, Haddenham, Cambs CB6 3ST.

432MHz Fixed Contest rules

1000–1500gmt 3 February 1980

The following general rules, published in this issue of *Radio Communication*, will apply: 1, 2, 3, 4a, 4c, 5a, 6a, 7a, 8, 9a, 10a, 11–22.

All entries and check logs to: VHF Contests Committee, c/o Mr F. Mathews, G8ACJ, Easedale, Woodway, Merrow, Guildford, Surrey GU1 2TF.

RSGB European Meteor Scatter Contest August 1979 results

In terms of the interest created and the number of stations active during the event, the first European ms contest organized by the RSGB must be rated as being a success. The total number of stations actually submitting contest entries, however, was disappointingly low and not at all representative of the ms activity in each of the countries taking part. although more than 120 stations from 26 different countries were logged as having made at least one successful QSO, only 15 entries from seven different countries were submitted for adjudication.

The reasons for this are not obvious, and it must remain a matter for speculation as to whether the lack of entries was due to a breakdown in communications when publicising the event, or to many stations seriously underestimating their achievements, perhaps because of the scoring system which was psychologically bad. Therefore, before the contest is repeated the system will need to be revised to take more account of distance.

As far as can be ascertained from the few comments received with the logs, most stations enjoyed the event and were well rewarded by the intensity of the Perseids shower. Bursts exceeding 50s were recorded on many occasions, allowing most contestants to work dx in excess of 1,500km.

The contest will be repeated next year on the same dates, to coincide with the peak of the meteor shower. It is not clear, however, whether contestants would prefer another 24 hour event during a weekday, or three separate evening sessions, each of eight hours duration. Any feedback on this, or on a revised scoring system which would make the contest more popular, would be appreciated.

The leading stations are to be congratulated on their success, and certificates of merit will be sent to the winner and runner-up. *G2HIF*

Posn	Callsign	Points	QSOs	QTH squares	Best dx	Km (approx)
1	G3SEK/P	400	20	20	SM3BIU	1,970
2	HG1YA	121	11	11	G3SEK/P	1,645
3	GU5CYN	120	12	10	SM3BIU	1,910
4	HG0KLZ	100	10	10	G4CLA	1,778
	YU3ULM/3	100	10	10	GD6UQ/P	1,710
6	HG5KDQ	94·5	10·5	9	GD6UQ/P	1,852
7	GM3WOH/P	49	7	7	I4EAT	1,892
	YU3TCD	49	7	7	SM3DCX	1,795
9	G3BW	45·5	6·5	7	HG1YA	1,600
10	GM4HAM	36	6	6	UC2AAB	2,140
11	HG4KXG	20	5	4	ON5EX	1,265
12	HG6KNB	9	3	3	SM3BIU	1,759
	YO6AFP	9	3	3	PA0RDY	1,660
	YU1AOP	9	3	3	SM7AED	1,345
15	SP4JYP	1	1	1	PA0RLS	1,085

October 1979 70MHz Fixed Contest results

As an experiment the duration of this contest was reduced to four hours. Of the 24 entrants only seven commented on the timing, and most of them thought that four hours was too short. Next year, therefore, the committee may give additional time for "winkling out the dx".

The logs show that 85 stations were active during the event and, although deep fading, electrical noise and sun noise helped to make the contest difficult for some, most found conditions to be about normal.

The winner for the past two years averaged about 12 points per QSO, and this year's winner is no exception. GD2HDZ considerably increased his average over last year to take first place, beating G4AEQ who again takes second place. Congratulations and certificates go to both. *G3VPK*

Posn	Callsign	Points	QSOs	QTH	Pwr	Ant
1	GD2HDZ	336	28	XO68	40	4Y
2	G4AEQ	314	44	YN48	130	4/4Y
3	G3UKV	264	41	YM28	25	4Y
4	G3XBY	244	42	ZM52	125*	5Y
5	G3BOC	229	29	YM16	40	4Y
6	G4CRC	222	17	XK63	50	4/4Y
7	G4ENB	200	43	ZL08	70	4Y
8	G3PWK	187	32	AM42	30	4Y
9	G3MXH	181	37	AL33	100	4Y
10	G4ERX	175	37	AL22	50	4Y
11	G8IL	172	34	ZL72	50	4Q
12	G3BPM	157	35	ZL48	25*	4Y
13	G3WMR	155	35	AL41	25*	6Y
14	G3PGN	137	35	AL22	35*	4Y
15	G4AEZ	130	32	ZL30	30	6Y
16	G3OHC	125	23	ZM31	60	D
17	G4BYP	119	21	YN57	75	D
18	G5UM	116	26	ZM35	10	4Y
19	G3ZMS	114	28	ZL10	25	4Y
20	G3JYP	113	17	YO38	133	5QY
21	G3CIO	89	15	ZO52	23	4Y
22	G3PJX	88	28	ZL69	50	3Y
23	G3FME	55	11	ZK15	36	4Y
24	G5DF	27	7	ZO51	25	4Y

*Solid-state pa.
Check log received from G3VPS/P.

1979 Listeners' VHF/UHF Championship results

The Hanson Trophy this year goes to a new winner, David Green, BRS34310, our congratulations for his efforts throughout the year.

Posn	Callsign	Points Total	March	April	July	Aug	Sept
1	BRS34310	2,983	745	92	738	48	1,332
2	BRS32525	2,895	369	55	973	—	1,498
3	BRS15822	2,155	368	56	805	140	786
4	BRS41733	715	—	—	—	—	715
5	BRS26003	702	172	—	530	—	—
6	BRS34740	549	455	94	—	—	—
7	BRS40920	542	87	—	—	—	455
8	BRS33823	200	200	—	—	—	—

IARU Region 1 UHF/SHF Contest October 1979 (RSGB results)

The contest again created a lot of activity in all IARU Region 1 countries, but the number of logs received by the RSGB was somewhat disappointing. It was noted, however, that over 90 per cent of those logs received were scored by the aid of computer. The committee does see the problem that groups without computers have to endure—scoring a large number of contacts using only the QTH locator map and a ruler! So, in future, the committee will be reconsidering the scoring in IARU events.

Congratulations to all the band leaders and to the Martlesham RS as overall leader. *G4BEL*

OVERALL RESULTS

MULTI-OPERATOR SECTION

Posn	Club	Points Total	432MHz	1,296MHz	2,304MHz
1	Martlesham RS	135,606	65,629	58,516	11,460
2	March & D RAS	73,645	31,955	41,690	—
3	Wulfrun CG	56,830	32,775	24,055	—
4	Hadrabs CG	47,229	37,679	9,550	—
5	Addiscombe ARS	37,557	23,567	6,770	7,220
6	Harwell AERE RC	35,806	35,806	—	—
7	G3LCH Gp	35,213	23,018	12,195	—
8	Reading ARC	28,049	22,968	3,080	—
9	G4BWH Gp	11,373	11,373	—	—

SINGLE-OPERATOR SECTION

Posn	Callsign	Points Total	432MHz	1,296MHz	2,304MHz
1	G3TDG	31,195	11,555	19,640	—
2	HB9BPQ/P	19,098	19,098	—	—
3	G4CQR	15,562	15,562	—	—
4	G3FYX	8,195	—	8,195	—
5	G8KAX	6,503	6,503	—	—
6	G8EDG/P	5,607	5,607	—	—
7	G8AZA	5,571	5,571	—	—
8	G8NDP	3,974	3,974	—	—
9	G3ZOI	3,794	3,794	—	—
10	G4HFO	3,177	3,177	—	—
11	G3PBV	3,124	3,124	—	—
12	G4GGV	1,726	1,726	—	—
13	G8LXY	1,204	1,204	—	—
14	G8ADC	980	—	—	980

432MHz MULTI-OPERATOR SECTION

Posn	Callsign	Points	QSOs	QTH	Pwr	Best dx	Km
1	G4BPO/P	65,629	249	AM67	350	DL9AR	598
2	G8PUB/P	37,679	123	YK21	400	PA0ERW	670
3	G3PIA	35,806	191	ZL34	400	F1DLT/P	662
4	GW3U-BX/P	32,775	152	YM44	250	DC8RA/P	786
5	G8PMH/P	31,955	148	AN61	300	DL9GS/P	525
6	G4ALE/P	23,567	111	AL16	80	HB9BPQ/P	718
7	G3LCH/P	23,018	123	ZN71	100	F6CCH/P	693
8	G4CCC/P	22,969	151	ZL54	100	PA0VTW	514
9	G4BWH	11,373	85	AL62	130	PA0WRC/P	368

432MHz SINGLE-OPERATOR SECTION

Posn	Callsign	Points	QSOs	QTH	Pwr	Best dx	Km
1	HB9BPQ/P	19,098	79	DG41	100	G4ALE/P	718
2	G4CQR	15,562	121	ZL49	100	PA0WRC/P	380
3	G3TDG	11,555	92	AL51	45	G8EEM	398
4	G8KAX	6,503	53	AL32	35	PA0WRC/P	364
5	G8EDG/P	5,607		YM49	8	F6CTT/P	361
6	G8AZA	5,571	23	ZO69	100	F6CTT/P	553
7	G8NDP	3,974	34	ZL10	10	PA0FHG/P	338
8	G3ZOI	3,794	35	ZL38	3	PA0EZ	392
9	G4HFO	3,177	20	YK03	10	F1ELL/P	371
10	G3PBV	3,124	18	YK32	16	F1ELL/P	385
11	G4GGV	1,726	18	ZL37	9	F6CTT/P	243
12	G8LXY	1,204	22	ZL09	10	F1ELL/P	207

1,296MHz MULTI-OPERATOR SECTION

Posn	Callsign	Points	QSOs	QTH	Pwr	Best dx	Km
1	G3XDY/P	11,703	54	AM67	100	DJ5BV	431
2	G3PMH/P	8,338	45	AN61	100	PA0BXA/P	386
3	G4GZI/P	4,921	37	ZM73	35	PA0MAR/P	383
4	GW3ONP/P	4,811	27	YM44	60	G3DAH	323
5	G3LCH/P	2,439	17	ZN71	15	G3LQR	245
6	G4ERX/P	1,910	10	YK21	4	G3XDY/P	394
7	G3SBV/P	1,354	12	AL16	40	PE0DOL	234
8	G3ULT/P	616	8	ZL54	30	G3PMH/P	223

1,296MHz SINGLE-OPERATOR SECTION

Posn	Callsign	Points	QSOs	QTH	Pwr	Best dx	Km
1	G3TDG	3,928	33	AL51	35	PA0EZ	367
2	G3FYX	1,639	13	YL38	40	G3XDY/P	266

2,304MHz

Posn	Callsign	Points	QSOs	QTH	Pwr	Best dx	Km
1	G3XDY/P	1,146	9	AM67	4	PA0EZ	268
2	G3RQZ/P	722	5	AL16	2	PA0EZ	291
3	G8ADC	98	3	ZL18	4	G8AYN	78

club news

RSGB affiliated societies and clubs, and RSGB groups, are invited to submit items for inclusion in "Club News" to their regional representatives (not direct to the editor).

Items of news and dates of forthcoming events should reach RRs by 17 January for the March issue.

Club secretaries are QTHR unless otherwise stated.

REGION 1—RR W. M. Furness, G3SMM, 16 Coniston Avenue, Sale, Cheshire M33 3GT.

Ainsdale (AARC)—Thursdays, fortnightly; 10, 24 January, 7, 21 February. Ainsdale Scout HQ. Full details from G2CUZ.

Blackburn (East Lancs ARC)—First Thursday in each month, 7.30pm. New venue: YMCA, Blackburn. Sec N. Jenkin, G4CGT, 5 Minster Crescent, Darwen.

Blackpool (B&DARS)—First Monday in each month. Phone G5ND (Blackpool 64508) for details of venue.

Bolton (B&DARS)—First and third Wednesdays in each month. Horwich Leisure Centre, Victoria Road, Horwich, Bolton, Sec John Debney, G8RWY, 2 Coverdale Avenue, Heaton, Bolton.

Bolton (Edbro RC)—Details from sec, c/o Edbro Ltd, Lever Street, Bolton.

Bury (BRS)—Tuesdays, 7.30pm. Second Tuesday in each month (Main meeting). Mosses Community Centre, Cecil Street, Bury. Publicity officer, Mike Bainbridge, G4GSY, tel 061-761 5083. Visitors always welcome.

Carlisle (C&DARS)—Mondays, 7.30pm. Currock House, Lediard Avenue, Currock, Carlisle. A very full programme of lectures and demonstrations has been arranged for the coming months. Full details from G8DVD.

Chester (C&DARS)—Tuesdays, 8pm, except first Tuesday in each month. YMCA, Chester. New sec, from whom further details can be obtained, D. Cutts, tel Gresford 3344.

Douglas (IoMARS)—Mondays, fortnightly. Keppel Hotel. Cregny-Baa, Nr Onchan. Sec GD4FWQ, tel Douglas 22295.

Eccles (E&DARC)—Tuesdays, 8.30pm. White Swan, Worsley Road, Swinton. CW class each week. Sec Chris Harrison, G8KRG, tel 061-797 0031.

Leyland (LHARG)—Second Monday in each month, 7.30pm. Rose & Crown, Ulnes Walton, Leyland. Details from G3XII.

Liverpool (L&DARS)—8 January (Club quiz), 15 January ("Microprocessor software" by G4EST), 22 January (Surplus equipment sale), 29 January (Visit by RR1), 5 February ("Antique telephones" by G8HLQ), 12 February (RSGB tape lecture), 19 February ("Parabolic antennas" by G3WOH), 26 February ("Liverpool's annals of history" by G4CVZ), 8pm. Conservative Association Rooms, Church Road, Wavertree, Liverpool. Thursdays (G3AHD cw practice session), 8.30pm on 144·250. Hon sec Al Neilson, G4CVZ, tel 051-220 5470. Visitors always welcome.

Liverpool (North Liverpool RC)—For details of meetings please contact R. Porter, G3VXK, 11 Cranmore Avenue, Crosby, Liverpool L23 0QD; tel 051-928 1610.

Liverpool University (UoLARS)—Meetings each lunchtime. Membership open to Polytechnic members and associated colleges. Shack in the Reilly Building, open anytime. Prospective members should contact Geoff Plucknett, G4FKA, UoL, 2 Bedford Street North, Liverpool L7 7BD.

Macclesfield (M&DRS)—Second Tuesday in each month, 7.45pm. For details of venue and programme contact Mary Roberts, 15 Park Brook Road, Macclesfield, tel Macclesfield 24383.

Manchester (M&DARS)—Wednesdays, 7.30pm. Morse practice most evenings, lecture on third Wednesday in each month. Newton Heath Community Centre, 203 Droylsden Road, Newton Heath, Manchester. New sec John Dent, G8OWY, 76 Lynwood Grove, Audenshaw, Manchester. Club station G3HOX active on hf and vhf.

Manchester (South Manchester RC)—Fridays; 4 January ("Lasers and holograms" by D. Bolton and T. Bootyman), 11 January ("Superboard" by G8ABJ), 18 January ("Construction techniques" by G3WFT), 25 January (Discussion on club project), 1 February ("Speech processors" by G4HON), 8 February ("History of SMRC" by G3HZM), 15 February (Surplus equipment sale), 22 February ("An evening with Roland"), 29 February (Mystery lecture), 7 March (Club quiz), 8pm. Mondays (Informal), 8pm. Sale Moor Community Centre, Norris Road, Sale. Hon sec David Holland, G3WFT, 32 Woodville Drive, Sale M33 1NF, tel 061-973 1837. Visitors always welcome.

Manchester (UMISTRS)—Wednesday afternoons, cw classes if required; Thursday evenings. The radio shack. UMIST Union bar. Prospective members please contact M. P. Doig, G4CQZ, UMIST RS, UMIST Union, PO Box 88, Sackville Street, Manchester M60 1QD. G3CXX/G8FOT active on 1·8/144MHz and, in the near future, on 432MHz/1·3GHz.

North Western Repeater Group—Third Thursday in each month (Informal), 8pm. Globe Club, Willows Lane, Accrington, Lancs. Details from sec G3RXH.

Ormskirk (OARC)—Tuesdays, 8.30pm. "Over 60's" Hut, Liverpool Road (opposite Christ Church). For details contact either G3SZV, tel Ormskirk 72100; or sec G4IGX, tel Ormskirk 75546. Club interests include vhf, uhf, hf, rtty and contests.

Penrith (Eden Valley RS)—Third Thursday in each month. Two Lions Hotel, Great Dockray, Penrith, Cumbria. Sec G4HYJ, *Herald* office, 14 King Street, Penrith, Cumbria. Full programme. Visitors welcome.

Preston (PARS)—Thursdays, fortnightly; 10, 24 January, 7, 21 February. Windsor Castle, St Paul's Square, Preston. Sec John Loftus, 14 Fishergate Hill, Preston, tel 53508.

Salford (Dial House RS)—Wednesdays, 5.30—9.30pm. Dial House, 21 Chapel Street, Salford, Lancs. Net channel 145·25MHz fm—the club station G3WDH monitors this frequency every club night for any other station. Details from sec G8JCL, c/o M43 at above address.

Stockport (SRS)—Second, third and fourth Wednesdays in each month; 9 January (Linear power supplies), 16 January (Club visit), 23 January (VHF gear), 8pm. 12 January (Annual dinner). Blossoms Hotel, Buxton Road, Stockport. Sec G3FYE. Club net Sundays 11am 3,692kHz. The club now has the additional callsign G8SRS.

Thornton Cleveleys (TCARS)—First and third Wednesdays in each month, 8pm; morse practise from 7.30pm. St John Ambulance Hall, Fleetwood Road North (next to Gardner's Arms), Thornton. Details from sec G8MKQ.

UK FM Group (Western)—First Thursday in each month, 8pm. Grappenhall Community Centre, Grappenhall, Nr Warrington. Sec G3LEQ, tel Knutsford 4040.

Warrington (W&DARS)—Tuesdays, 7.45pm. Grappenhall Community Centre, Bellhouse Lane, Grappenhall, Warrington. Sec G3MMD, tel Lymm 3533.

Wigan (Douglas Valley ARS)— First and third Thursdays in each month; 7 February (Open evening for anyone interested in amateur radio). Shevington Conservative Club, Shevington, Wigan. Details from G4EHK, tel Appley Bridge 3320.

Winsford (Mid-Cheshire ARC)—Wednesdays. RAE class 7pm to 8pm. Morse class every third Wednesday. Technical Activities Centre, rear of Verdin Building, Verdin Comprehensive School, Grange Lane, Winsford. Net nights 1·8MHz Monday, 8pm; 144MHz (fm) Tuesdays. Hon sec G3JWK.

Wirral (WARS)—First and third Wednesdays in each month, 7.45pm. Sports and Recreation Centre, Grange Road West, Claughton, Birkenhead. Hon sec G3DLF.

Wirral (W&DARC)—Second and fourth Wednesdays in each month, 8pm. Sports Concourse, West Kirby, Wirral. Hon sec Malcolm Mackintosh, G8NMG, tel 051-334 1027.

Will all club representatives please note that the deadline in the heading to "club news" *is* critical.

RR1 extends to all Society members in Region 1 his very best wishes for 1980. Pressures from various directions precluded a regional meeting in 1979, but it is hoped to arrange one for the Spring of 1980.

REGION 2—RR D. S. Smith, G4DAX, Red Roof, Goathland, Whitby, North Yorks YO22 5AN. Tel Goathland 333.

Following information is latest received.

Bradford (UBARS)—Thursdays, 7.30pm. N10, Main Building. Sec G8GOV, 30 Moorfield Drive, Baildon, Shipley, West Yorks. Net frequency 145·275.

Denby Dale (DD&DARS)—Second and fourth Wednesdays in each month, 7.30pm. Pie Hall, Denby Dale. Sec G3FQH. Visitors always welcome.

Doncaster (Doncaster Metropolitan Institute of Higher Education ARC)—Details from sec Robert Lane, G4AWU, Kelston, Doncaster Road, Bawtry, Doncaster, S Yorks. Club call G3UER.

Goole (G&DARS)—Fridays, 7.30pm (during school term only). Goole Grammar School. Details from chairman G3VBI.
Halifax (Northern Heights ARS)—16 January (Film night), 7.45pm. Bradshaw Tavern, Bradshaw, Nr Halifax. Sec G8NUC.
Hornsea (HARS)—Wednesdays, 8pm. New venue, The Mill, Mill House, Attic Road, Hornsea. New sec Mrs J. Heathershaw, G4CHH.
Hull (H&DARS)—Fridays, 8pm. RAE classes are held at 9pm each Friday. Kingston Community Centre, Fountain Road, Hull. Sec G8GLM, 27 Trafford Road, Willerby, Hull HU10 6AJ.
Hull (Hull University R&ES)—Tuesdays, 1.15pm. Room 313B, University Union Building, Cottingham Road. Enquiries to G8RPZ. All amateurs welcome.
Leeds (White Rose RS)—Wednesdays, 8pm. Moortown Rugby Football Club, Moss Valley, Alwoodley, Leeds 17. Sec G4DZI.
Leeds (LUUARS)—Tuesdays, 8pm. Union Annexe (second floor), Woodhouse Lane. All new students welcome. Sec G4CNG, QTHR, or at "E" block, Lupton Flats, Alma Road, Leeds 6, during term.
Otley (OR&ES)—Tuesdays, 8pm. 14 Back of Court House Street, Otley. Sec G8DFZ.
Pontefract (P&DARC)—Details from sec G4AAQ, 1 Balmoral Drive, Ferrybridge, Nottingly WF11 8RQ.
Scarborough (SARS)—Mondays, 7.30pm. Scarborough Cricket Club, North Marine Road, Scarborough. Sec G4EDR. All visitors welcome. Talk-in by arrangement.
Sheffield (SARS)—Third Monday in each month, 8pm. Sheaf House Hotel, Bramell Lane, Sheffield. Sec G4APV, 321 Fulwood Road, Sheffield S10. Visitors and swls particularly welcome.
UK FM Group (Northern)—Sec G8PLJ. Do you use GB3NA? Your subs or donations would help support the service provided by this repeater.
Wakefield (W&DARS)—Second and fourth Tuesdays in each month. 7.30pm. Holmfield House, Thornes Park, Wakefield. Sec Andrew Walker, G4ARH, tel Horbury 274607.
York (YARS)—Fridays (except third in each month), 7.30pm. United Services Club, 61 Micklegate, York. Sec G3WVO.

REGION 3—RR H. S. Pinchin, G3VPE, 61 Cole Bank Road, Hall Green, Birmingham B28 8EZ. Tel 021-777 1320.

Birmingham (Midland ARS)—22 January ("Computers and the radio amateur" by Paul Winwood, G8KIG), 19 February ("Make the most of your mobile" by Chris Kirby, G4FZN), 8pm. Room 118, University of Aston, Gosta Green, Birmingham. Sec G8BHE.
Birmingham (Slade RS)—First Friday in each month, 7.45pm. The Committee Room, Church House, Erdington, Birmingham. Sec G4FGF.
Birmingham (South Birmingham RS)—Thursdays (HF night on the air), Fridays (Construction and morse classes), 7.30pm. 6 February, 5 March, 8pm. Hampstead House, Fairfax Road, West Heath, Birmingham B31 3QY. Sec G4GZI.
Birmingham (University of Birmingham ARS)—Thursdays during term, 8pm. Tuesdays (RAE classes), 7pm. Morse classes as required, lunch-time. Students' Union (above stage). Sec G8HTH. Club stations G3IUB and G8IUB. University and non-university visitors welcome.
Bromsgrove (B&DARC)—8 February, 14 March (AGM), 8pm. Avoncroft Art Centre, Bromsgrove. Sec G4HFP, tel Stourport (02993) 3818.
Burton-on-Trent (BonT&DARS)—Wednesdays, 8pm. Stapenhill Institute, Main Street, Stapenhill, Burton-on-Trent. Sec G3ACR.
Cannock Chase (CCARS)—First Thursday in each month (Formal); other Thursdays (Informal); 17 January ("HF antennas" by John Morris, G3ABG and Don Perks, G3SVH), 8pm. Bridgetown War Memorial Club, Union Street, Bridgetown, Cannock. Sec G4IDK, tel Penkridge (078571) 2067. Visitors and new members welcome.
Coventry (CARS)—18 January (RTTY open night), 25 January (HF night on the air), 1 February (Visit to Radio Leicester), 8 February (HF night on the air), 15 February (Beech's quiz), 22 February, 29 February (Visit to PO sorting office), 7 March, 14 March, 8pm. Baden Powell House, 121 St Nicholas Street, Radford, Coventry. Sec G8SEQ. Visitors welcome.
Coventry Technical College (CTCARS)—Mondays, 7pm. Winfray Annexe of the college. Sec G8ISJ.
Coventry (University of Warwick ARS)—Wednesdays during term, 7pm. Cryfield Farm, University of Warwick. Talk-in on S20, or contact G4BXI or G4DCW, Hurst Flat 40, Cryfield Village, University of Warwick.
Dudley (DARC)—Second and fourth Tuesdays in each month, 7.45pm. Central Library, Dudley. Sec Norman Rock, 28 Conway Close, High Acres, Kingswinford, Brierley Hill DY6 8PT.
Hereford (HARS)—First and third Fridays in each month, 8pm. Civil Defence HQ, Gaol Street, Hereford. Sec G4CNY.
Lichfield (Chad RC)—Alternate Wednesdays, commencing 16 January, 8pm. The Naval Club, Burton Old Road, Lichfield. Sec G4ESK.
Lichfield (LARS)—First Monday and third Tuesday in each month, 8pm. "Swan" (bar), Lichfield. Sec Ted Bowen, RS33003, tel Ibstock (0530) 60396.
Malvern Hills (MHRAC)—Second Tuesday in each month, 7.30pm. The "Star", Cowleigh Road, North Malvern. Sec G3IPY.
Mid-Warwickshire (MWARS)—First and third Mondays in each month, 8pm. 61 Emscote Road, Warwick. Sec G8RZR.
Redditch (RRC)—Second and fourth Thursdays in each month, 8pm. WRVS Centre, Ludlow Road, Redditch. Sec G3EVT.
Rugby (RATS)—Wednesdays, 7.30pm. Cricket pavilion entrance to B Building, Rugby Radio Station, A5 trunk road, Hillmorton, Rugby. Sec G4ECO.
Shrewsbury (Salop ARS)—Thursdays, 8pm. Albert Hotel, Smithfield Road, Shrewsbury. Sec G3UDA. New members welcome.
Solihull (SARS)—15 January ("From OWL to G4" by Stan Jones, G4AXW), 19 February, 7.30pm. The Manor House, High Street, Solihull. Morse classes available. Sec G4BBT. New members and visitors welcome.
Stoke-on-Trent (North Staffs ARS)—First and third Mondays in each month (Lectures, etc), other Mondays (Natternights, Raynet and club station, G4BEM), 7.30pm. Harold Clowes Community Centre, off Dawlish Road, Bentilee, Stoke-on-Trent. Sec G8ORU. New members welcome.
Stoke-on-Trent (SonTARS)—Thursdays, 7.30pm. 2a Racecourse Road, Oakhill, Stoke-on-Trent. Sec G4CWN.
Stourbridge (StARS)—14 January (Annual dinner—see Malcolm Davies, G8JTL), 21 January (Constructional contest), 4 February (Constructional evening), 18 February (TVI talk), 3 March (Constructional evening), 17 March (AGM), 7.45pm. Library, Longlands School, Brook Street, Stourbridge. Sec G4IEB.
Stratford-upon-Avon (SuponA&DARC)—Every third Friday, commencing 1 February, 7.30pm. The Clubroom, Swimming Pool, Bridgefoot, Stratford. Sec G4EXR, tel Stratford (0789) 5638, weekends only. New members welcome.
Sutton Coldfield (SCRS)—Second and fourth Mondays in each month, 7.30pm. Central Library, Sutton Coldfield. Sec G8LTW.
Tamworth (TARS)—Second and fourth Mondays in each month, 7.30pm. White Lion, Lichfield Street, Tamworth. Other Mondays (Informal). Club shack. Sec G4FZN, tel Tamworth (0827) 69708. Club net Wednesdays 145·375MHz, 9pm. Visitors welcome.
Telford (T&DARS)—Wednesdays, 7.30pm. Phoenix Centre, Webb Crescent, Dawley. Sec G3UKV, tel Telford (0952) 55416. Visitors welcome.
Walsall (WARC)—Alternate Wednesdays, commencing 23 January, 8pm. Forest Community Centre, Forest School, Hawbush Road, Leamore, Walsall. Sec G4GKC, tel Walsall 31675.
Willenhall (W&DARS)—Alternate Wednesdays, commencing 23 January. Three Crowns, Stafford Street, Willenhall. Sec M. P. Batchelor, 19 Newlands Close, Willenhall, West Midlands WV13 2DQ. New members welcome.
Wolverhampton (WARS)—14 January (Discussion and progress report on quad project), 21 January (Workshop practice), 4 February (WARC 1979), 11 February (The forthcoming Wolverhampton repeater on 432MHz), 18 February (Natternight), 25 February (Discussion on 144MHz df hunts), 3 March ("Amateur tv" by Derek Bellingham, G8JBT), 10 March (Surplus sale), 8pm. Neachells Cottage, Danescourt Road, Stockwell End, Tettenhall, Wolverhampton WV9 9PH. Sec G8EDG.
Worcester (W&DARC)—4 February ("The Worcester skycan ufo group", slide show and talk), 3 March, 8pm. Old Pheasant, New Street, Worcester. Sec G4EKG, tel Evesham (0386) 41105. New members and visitors welcome.

REGION 4—RR N. J. H. Grassby, G4CPY, 22 St Cuthberts Avenue, Great Glen, Leicester. Tel 053 759 3387.

Following information is latest received.
Derby (D&DARS)—Wednesdays, 7.30pm. Tuesdays and Fridays (Morse classes), 7pm. 119 Green Lane, Derby. Sec Jenny Shardlow, G4EYM.
Derby (NHARG)—Fridays, 7.30pm. Nunsfield House, Boulton Lane, Alvaston, Derby. Sec Ian Cage, G4CTZ.
Glenfield (Leicestershire Raynet Group)— Monthly. County Hall, Glenfield. Further details from M. G. Barker, G8CAC.
Grimsby (GARC)—First and third Thursdays in each month, 8pm. Alexandra Club, Cleethorpes.
Leicester (LRS)—Mondays, 7.30pm. Club House, Gilross Estate Cottage, off Groby Road, Leicester.
Leicester (LPARS)—Mondays, Wednesdays, Thursdays and Fridays, lunchtime during term. Leicester Polytechnic. Sec R. Newstead, G3CWI, 24 Richmond Road, Leicester.

Lincoln (LSWC)—Second and fourth Wednesdays in each month. Lincoln Corporation Social Club, Waterside South, Lincoln. Sec R. Shaw, G3VRD.
Mansfield (MARS)—First Friday in each month, 7.30pm. New Inn, Westgate, Mansfield.
Matlock (Derwent Valley ARS)—First Monday in each month, 7.30pm. "The Royal Oak", Tansley, Nr Matlock. Guest speakers each month.
Melton Mowbray (MMARS)—Third Friday in each month, 7.30pm. St John Ambulance Hall, Asfordby Hill, Melton Mowbray. Sec Richard Winters, G3NVK.
Nottingham (ARCON)—Thursdays, 7.30pm. Sherwood Community Centre, Mansfield Road, Nottingham. Sec M. Shaw, G4EKW.
Nottingham (Trent Polytechnic RS)—Wednesdays. Newton Building, Room 105. Further information from the chairman Paul Robinson, via Students' Union, Trent Polytechnic.
Nottingham University (NURC)—Tuesdays. Contact R. Dixon, G4BVY, c/o Students' Union, Nottingham University.
Scunthorpe (SARC)—Tuesdays, 7.30pm. The Hobbies Centre, Franklyn Crescent, Scunthorpe. Sec J. Stace, G4FUH.

The RR would be pleased to hear from all club secretaries in the region, either by post or telephone.

REGION 5—RR R. E. G. Kendall, G8BNE, 19 Willow Green, Needingworth, Huntingdon PE17 3SW.
Following information is latest received.
Bedford (B&DARC)—Wednesdays, 8pm. Ravensden. Sec G4FFC.
Cambridge (C&DARC)—Fridays, 7.30pm. Air Training HQ, Newmarket Road. Sec G4BAO, 20 Guest Road, Cambridge CB1 2AL.
Cambridge (CUWS)—Mondays. Queen's Bar. Details from Adrian Langford, G8PQP, St John's College.
Corby (CARG)—Fridays, 7.30pm. Hightrees Scout Centre, The Nook, Corby. Sec G8MLA.
Dunstable (DDRC)—Fridays, 8pm. Chews House, 77 High Street South, Dunstable. Sec G8ASP.
March (M&DRAS)—Tuesdays, 7.30pm. 2 Grays Lane. Sec G8GNE.
Northampton (NRC)—Thursdays, 8pm. Kingsthorpe Community Centre, Thornton Park, Kingsthorpe, Northampton. Details from sec I. P. A. Scott-Iversen, 35 Milverton Crescent, Abmington Park, Northampton.
Peterborough (GPARC)—Fourth Thursday in each month, 7.30pm. Southfields Junior School, Stanground, Peterborough. Sec G4FDF.
Peterborough (PR&ES)—For details contact G3EEL.
Shefford (S&DARS)—Thursdays, 8pm. Church Hall. Hon sec G4DAQ.
St Neots (Foster Cambridge RC)—Tuesdays, 8pm. Foster Cambridge Ltd, Howard Road, Eaton Socon, St Neots. Details from P. Dineen, 5 Reynolds Drive, Little Paxton, St Neots.

REGION 6—RR F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks HP13 7EA. Tel Penn (049481) 4240.
Banbury (BARS)—Last Friday in each month, 7.30pm. St Paul's Church Hall, Warwick Road, Banbury. Sec G. Reason, G4EBF, tel Croughton (0869) 810794.
Bracknell (BARC)—Mondays, 8pm. Coopers Hill Centre (adjacent to station). For meeting details please contact sec D. Williams, G4CVN, tel Windsor 56096.
Burnham Beeches (BBRC)—First Monday in each month, 8pm. Hedgerley Scout Hut, Hedgerley, Nr Slough, Bucks. Sec G. C. Teague, 59 Rose Avenue, Hazlemere, Nr High Wycombe, Bucks. New members, visitors and swls welcome.
Harwell (Atomic Energy Research Establishment RC)—Fridays, lunchtime. The Shack, AERE Harwell, Didcot, Berks. For further meeting details contact sec G8DVK.
High Wycombe (Chiltern ARC)—30 January (AGM), 8.15pm. John Hawkins Ltd, Victoria Street, off Oxford Road (A40), High Wycombe. Further details from sec W. Catterall, 78 Fairacres, Prestwood, Great Missenden, Bucks, tel Great Missenden 4504.
Maidenhead (M&DARS)—First Thursday and third Tuesday in each month. Red Cross Hall, The Crescent, Maidenhead. Sec P. J. Patich, G3TWG, tel 06285 25275.
Mid-Thames RDF Club—For competition details, please contact sec T. C. Gage, 28 Aldbourne Road, Burnham, Bucks SL1 7NJ, tel Burnham 63363.
Newbury (N&DARS)—Second Tuesday in each month. Newbury Technical College. Details from sec G8LTD, tel Newbury 46078.
Newport Pagnell (Milton Keynes ARS)—8pm. Lovatt Hall, Newport Pagnell, Bucks. For further details contact sec D. White, G3ZPA, Rose Cottage, Whaddon Road, Shenley Brook Road, Milton Keynes MK5 7AF, tel Shenley Church End 310.
Oxford (O&DARS)—Second and fourth Wednesdays in each calendar month, 7.30pm. Civil Service Social Club, Marston Road, Oxford. New sec J. G. Bright, G4HJL, 22 Westfield Road, Long Wittenham, Abingdon, Oxon OX1 4RF.
Oxford University (OURS)—Please contact sec M. Evans, G8LTE, Worcester College, Oxford, for meeting details.
Reading (RARC)—Details from sec Chris Young, G4CCC.

REGION 7—RR D. A. G. Pedder, G3LFX, 97 Elgar Avenue, Tolworth, Surbiton, Surrey KT5 9JS.
Following information is latest received.
Addiscombe (AARC)—Tuesdays, 9.15pm. Spreadeagle, Portland Road, South Norwood. Sec G3SJX, tel 01-656 9054. New members and visitors most welcome.
Ashford (Echelford ARS)—Second Monday and last Thursday in each month, 7.30 for 8pm. The Hall, St Martin's Court, Kingston Crescent, Ashford, Middx. Sec G3TDR, tel Staines 56513.
Bexley Heath (North Kent RS)—8pm. St Mary's Institute, 2 North Cray Road, Bexley. Sec G3VFD.
Coulsdon (CATS)—Sec A. R. Bartle, G6HC, tel 01-684 0610.
Cray Valley (CVRS)—First and third Thursdays in each month, 7.30 for 8pm. Christchurch Centre, High Street, Eltham, London SE9. For details of morse classes run by the club contact sec. Sec G4FUG.
Croydon (Surrey Radio Contact Club)—First and third Wednesdays in each month, 7.30pm. TS Terra Nova, 34 The Waldrons, Croydon. Sec G4FFY.
Crystal Palace (CP&DRS)—Third Saturday in each month, 8pm. Emmanuel Church Hall, Barry Road, London SE22. First Tuesday in each month (Open house). Members' QTHs. Sec G3FZL.
Guildford (G&DRS)—Second and fourth Fridays in each month, 8pm. Model Engineers HQ, Stoke Park, Guildford. Sec G4BHQ.
Guildford (University of Surrey E&ARS)—Informal meetings, lunchtimes during term. Lower Bar, Union House, G8AHK is active on vhf, and G3IGQ on hf. Skeds and QSOs always welcome. Sec G8MIO, tel Guildford 71281.
Kingston (K&DARS)—Second Wednesday in each month, 8.15pm. Berrylands Scouts and Guides HQ, Stirling Walk, Raeburn Avenue, Surbiton. Sec G4APG, tel 01-399 8113.
New Cross (Clifton ARS)—Fridays, 8pm. 225 New Cross Road, London SE14. Details from R. A. Hinton, 42 Sutcliffe Road, Welling.
Redhill (Reigate ATS)—Third Tuesday in each month, 8pm. Constitutional Centre, Warwick Road, Redhill. First Tuesday in each month. Marquis of Granby, Hooley Lane, Redhill. Sec G3XSZ.

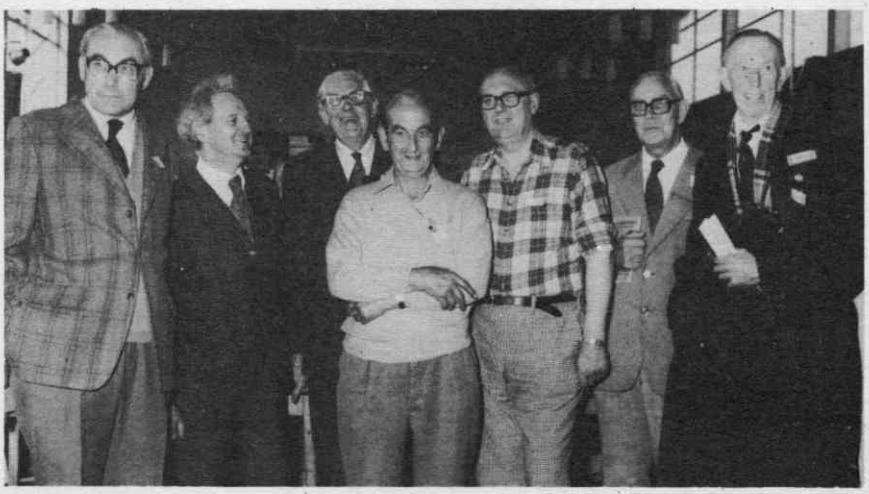
The president of the Sutton & Cheam RS, Bert Tillin, G3MES, presenting the Cullen Cup to Robin Powell, G3OGP, of the Thames Valley ARTS at a TVARTS social evening. The cup is a local trophy between the two clubs, and is presented each year to the club with the highest score in the Affiliated Societies Contest. Left to right: G3AIU, G3PCC, G3OGP, G3MES, G8SM (president of TVARTS), and Hermione (xyl of G3GTX). *Photo:* G3GHS

Sutton & Cheam (S&CRS)—For meeting details contact hon sec G. W. Brind, G4CMU, tel 01-225 4497.
Thames Ditton (Thames Valley ARTS)—Giggs Hill Green Library, Giggs Hill Road, Thames Ditton. Sec G3ZNW.
Tolworth (Decca ARG)—First Thursday in each month, 8pm. Decca Sports and Social Club, Kingston Road, Tolworth. Sec G3NFV, tel Leatherhead 72587.
Wimbledon (W&DRS)—Second and last Fridays in each month, 8pm. St John Ambulance HQ, 124 Kingston Road, Wimbledon. Sec J. W. Todd, tel 01-540 9031.

REGION 8—RR D. N. T. Williams, G3MDO, Seletar, New House Lane, Thanington, Canterbury, Kent. Tel 0227 66586.
Following information is latest received.
Brighton (B&DRS)—8pm prompt. Catholic Church Hall, Bristol Road, Brighton. Details from N. Hewitt, G8JFT.
Burgess Hill (Mid-Sussex ARS)—Alternate Thursdays, 7.30pm. Marle Place Further Education Centre, Leylands Road, Burgess Hill. Details of future events from G3JMB or G4HHB.
Canterbury (East Kent RS)—10 January (Grand junk sale). Further details from G3MDO.
Chichester (C&DARC)—Details of future events from J. Chinn, 5 Shrubbs Drive, Middleton-on-Sea, Bognor Regis PO22 7SL, tel 2335.
Crawley (CARC)—Details of future events from G3MGL, tel 0293 20986.
Dartford (DHDFC)—Second Friday in each month. Scout House, Broomfield Road, Dartford. Details from Jeanette Maggs, 25 Leybridge Court, Eltham Road, Lee, London SE12.
Dover (South East Kent YMCA ARC)—Wednesdays, 7.30pm. Further details from G8PZA or G8KEN.
Eastbourne (Southdown ARS)—First Monday in each month. Details from R. Jeffries, G8KQN, 84 Mill Road, Hailsham, Sussex BN27 2HU; or pro G3LFZ.
Gravesend (GRS)—Mondays, 7.30pm. Windmill Tavern, Shrubbery Road, Gravesend. Details from G4GML.
Hastings (HE&RC)—Fridays. 479 Bexhill Road, St Leonards-on-Sea, Sussex. Third Wednesday in each month, 7.30pm. West Hill Community Centre, Croft Road, Hastings. Details of events from G4FET.
Horsham (HARC)—First Thursday in each month. Parish Rooms, The Causeway, Horsham. Details of future events from A. C. Wadswirth, G3NPF.
Kent Repeater Group—Details of membership from G3XDV.
Maidstone (MYMCAARS)—Fridays; first and third in each month devoted to the beginner; 7.30pm. Y Sports Centre, Melrose Close, Loose, Maidstone. Details of events from sec J. A. Hastie, tel Medway 251387.
Medway (MARTS)—Details of events and venue from G4EVY.
Sussex Repeater Group—Information from G8HVV.
Tunbridge Wells (West Kent ARS)—Alternate Fridays. Adult Education Centre, Monson Road, Tunbridge Wells. Tuesdays following the Fridays (Informal). Drill Hall, Victoria Road. Details from Brian Castle, G4DYF.
Worthing (W&DARC)—Tuesdays, 8pm. Adult Education Centre, Union Place, Worthing. Details from G8MSQ.

REGION 9—RR H. W. Leonard, G4UZ, 4 Start Bay Park, Strete, Dartmouth TQ6 0RY. Tel Stoke Fleming 505.
Camborne (Cornish RAC)—First Thursday in each month; 3 January (Tape lecture), 7 February ("QRA locators" by G3XFL, "National grid references" by G4IGN, and "Amateur marine mobile and radio navigation" by G3VGO), 7.30pm. SWEB Clubroom, Pool, Camborne. Full details from G3VGO, tel Devoran 864255. Cornish net each weekday 10am on 3·715MHz, and on Sundays 11am on 3·682MHz. Visitors always welcome at club meetings.
Exeter (EARS)—Second Monday in each month, 7.30pm. Community Centre, St Davids Hill, Exeter. Full details from Jack Bawden, 232 Exwick Road, Exeter EX4 2BA.
Exeter University (EUARS)—Sundays, 2.30pm. Full details from Julian Corben, G4EXT, c/o "Devonshire House", Stocker Road, Exeter EX4 4PZ.
Exmoor (ERC)—Second and fourth Thursdays in each month, 7.30pm. "Loughrigg", East Street, South Molton. Full details from Dave Stone, tel North Molton 377.
Exmouth (EARC)—Alternate Wednesdays, 7.30pm. Rolle College, Exmouth. New hon sec Mrs J. Nicholson, 35 Hollymount Close, Symonds Farm, Exmouth, tel 77263.
Newquay (N&DARS)—Alternate Wednesdays, 7.30pm. Treviglas School, Newquay. Full details from new sec Ted Warne, G3YJX, tel Wadebridge 2772.
North Devon (NDRC)—Second Wednesday in each month, 7.45pm. Pilton Community College, Barnstaple. Fourth Wednesday in each month. QTH of G2FKO, 38 Clovelly Road, Bideford. Full details from G4CG. Tel Barnstaple 3683.
Plymouth (PRC)—Alternate Mondays, 7.30pm. Whitleigh Methodist Church, Budshead Road, Whitleigh, Plymouth. Further details from John Butcher, G4GWJ.
Plymouth [Plymouth Polytechnic ARS)—For details contact R. Taylor, G4HZA, Amateur Radio Society, Plymouth Polytechnic Students' Union, Drake Circus, Plymouth. Club station is G3TCP, with listening facilities available on 3·5–28MHz, 144 and 432MHz, for 24 hours every day in term time.
Saltash (S&DARC)—First and third Fridays in each month, 7.30pm. Burraton Toc-H Hall, Saltash. New sec D. Bunce, 47 Hobbs Crescent, Saltash, tel 2839.
Torbay (TARS)—Fridays, with special meeting on last Saturday in each month; 26 January (Speech processing), 23 February ("Dartmoor" by Peter Wakeham), 7.30pm. Bath Lane, rear of 94 Belgrave Road, Torquay. Full details from Mrs Ged Coker, c/o G4FCN, tel Ipplepen 812117. Torbay net Mondays, Wednesdays and Fridays 10.30am on 3·756MHz, and Saturdays 10am. 144MHz net Mondays 8pm on S22. Visitors most welcome at club meetings.

A happy and prosperous new year to all—*RR9.*



Happy faces at the Torbay ARS rally in August included those of this group: L to r: G6XA; G5HD, Zone D Council member; G4UZ, Region 9 representative; G2CWR, president, Torbay ARS; G8CK; G3JEP and G3KDL

REGION 10—RR R. G. Barrett, GW8HEZ, 23 Carshalton Road, Beddau, Pontypridd, Glam.

Following information is latest received.

Barry (BCoERS)—Thursdays, 8pm. In addition, special events are arranged every fortnight. New venue: Weycook Cross, Five Miles Lane, Barry. Details from new sec M. E. Woodberry, GW8OPK, 60 Pen-y-Graig, Rhiwbina, Cardiff, tel 613635.

Blackwood (BARS)—Fridays, 7pm. Oakdale Community Centre, Oakdale, Blackwood, Gwent. Details from GW4BLE, 10 Llanthewy Road, Newport, Gwent.

Bridgend (B&DARC)—Second Wednesday in each month, 7.30pm. NCB Social Club, Tondu, Bridgend. Details from sec GW4BDV.

Cardiff (CRSGBG)—Second Monday in each month, 7.30pm. Pantmawr Inn, Pantmawr Estate, Cardiff. Details from GW3GHC.

Merthyr (Hoover ARS)—Mondays, 7.30. Hoover Social Club, Pentrebach, Merthyr. Details from GW3RNC.

Newport (NARC)—Mondays, 7pm. Adult Education Settlement, Brynglas Road, Newport. Details from GW8MER.

Pembroke (PRSGBG)—Last Friday in each month, 7.30pm. Defensible Barracks, Pembroke Dock, Dyfed. Details from sec GW3XJQ.

Port Talbot (British Steel Corporation ARS)—Thursdays, 7.30pm. BSC Sports and Social Club, Margam. Port Talbot. Details from GW4BDV.

Rhondda (RARS)—Every other Thursday, 7.20pm. Transport Employees' Club, Porth. Details from GW3PHH.

Sully (S&DSWC)—Mondays fortnightly, 7pm. Sully Bowls and Social Club, 58 South Road, Sully, Cardiff. Details from David Hughes. 13 Nailsea Court, Sully.

Swansea (SARS)—Tuesdays fortnightly, 8pm. Sketty Sports and Social Club, Aneurin Way, Sketty, Swansea. Details from GW4GRI.

Swansea (University College of Swansea RS)—Mondays, 7.30. Room 801, Applied Science Building. Details from sec J. Morris, 1 Hadland Terrace, West Cross, Swansea, tel 68675.

REGION 11—RR P. H. Hudson, GW3IEQ, Silhill, Dinas Dinlle, Caernarvon.

Following information is latest received.

Bangor (UCNWARS)—Thursdays, 7.30pm. Small Lecture Theatre, School of Engineering Science, Dean Street, Bangor.

Conway Valley (CVARC)—Second Thursday in each month, 7.45pm. The Quaries, Llandulas, Colwyn Bay.

Rhyl (R&DARC)—Fourth Thursday in each month. Ambulance Station, Coast Road, Rhyl. Other Thursdays (On the air on 144·00MHz), 8pm. Newcomers and visitors welcome.

REGION 12—RR F. Hall, GM8BZX, 45 Priory Cottages, Lunanhead, Forfar, Angus DD8 3NR.

Aberdeen (ARS)—Fridays, 7.30pm. 80 Guild Street, Aberdeen (next to Station Hotel immediately adjacent to railway station). Sec GM4BKV. The club now has a print board service from your own artwork.

Dundee (Kingsway Technical College ARC)—Tuesdays; 6.30pm morse practice, 7–8pm arranged lectures, 8–8.15pm coffee, 8.15–9pm any other business and discussions. Programme details from sec GM8RDU.

Elgin (Moray Firth RS)—First Wednesday in each month. External venue. Other Wednesdays. Within Elgin Technical College. Due to small membership the arrangements may be varied. For full details contact GM4IAO or GM3KHH.

Invergordon (Easter Ross RC)—Every second Tuesday. 100 High Street, Invergordon. Details from sec GM4DKL.

Inverness (Technical College ARC)—Every second Wednesday, 6.45pm. Room C30. Sec W. Lee, 36 Old Mill Road, Inverness.

Kirkwall—Members now meet on a few occasions during the year to discuss various aspects of amateur radio. Information from GM3IBU, tel Kirkwall 3232.

Perth (P&DARG)—First and third Tuesdays in each month. Room M1/15, Perth College of Further Education. Chairman GM8JCR. Details of programmes from sec Ian McLaren, GM8RYZ, 75 Viewlands Road West, Perth.

Shetland (Lerwick RC)—Wednesdays, 7.30pm. "Annsbrae House". Information from sec GM4BBL. Visitors always welcome. It is anticipated that a move will be made to new premises in Lerwick sometime during the coming year.

RR12 would be pleased to hear from club secretaries regarding club programmes. Please note the closing dates for information at the beginning of this feature.

REGION 13—RR A. B. Givens, GM3YOR, 41 Veronica Crescent, Kirkcaldy, Fife KY1 2LH. Tel Kirkcaldy (0592) 200335.

Following information is latest received.

Berwick-upon-Tweed (B&DARS)—First and third Fridays in each month, 7.30pm. Avenue Hotel, 122 Marygate, Berwick-upon-Tweed. Details from sec GM8IIO.

Dalgety Bay (Marconi Space & Defence Systems ARC)—Open to employees and ex-employees of the company. Tuesdays, 7.30pm. MSDS Social Club, Hillend Industrial Estate, Dalgety Bay, Fife. Details from GM3YND, tel Dalgety Bay 822678.

Dunfermline (DARS)—Second Wednesday in each month, 7.30pm. CCTV Studio, Pittencrieff School, Maitland Street, Dunfermline. Details from GM3CIG.

Edinburgh (E&DARC)—Tuesdays, 7.30pm. City Observatory, Calton Hill, Edinburgh. Details from sec GM8MJV, tel 031-663 2033.

Edinburgh (Ferranti Recreation Club AR Section)—Membership is restricted to company personnel. Details from GM8JKG, tel 031-441 5684. Visits by other clubs by prior arrangement.

Edinburgh (GB3ED Repeater Group)—GB3ED is a 432MHz repeater situated at Napier College, Edinburgh, and operating on channel RB14 (output 433·350MHz, input 434·950MHz). Details of group meetings from GM3GBX, tel 031-447 2611.

Edinburgh (Heriot Watt University ARC)—Open to persons attending any of the city's universities or colleges. Wednesdays, 2pm. Aerial Laboratory, Top Floor, Mountbatten Buildings, 31–35 Grassmarket, Edinburgh. Informal get-togethers, 7.30pm. University Bar, Riccarton Campus, Currie, Midlothian. Details from GM4EAU, tel 031-443 5061.

Edinburgh (Leith Nautical College ARC)—First and third Thursdays in each month, 7.30pm. Leith Nautical College, 24 Milton Road East, Edinburgh 15.

Edinburgh (Lothians RS)—Details of programme from GM8BJF, tel 031-447 5527.

Glenrothes (G&DARC)—Third Sunday and every Wednesday in each month; 20 January, 7.30pm. Old Nursery School Building, Provosts Land, Douglas Road, Leslie, Fife. Details from GM4HBG, tel Glenrothes 771057. Club nets Sunday, 3·630MHz 1100 local, and S22 1200 local.

St Andrews (University of St Andrews R&ES)—Details from Physics Department, North Haugh, St Andrews.

REGION 14—RR (*Post vacant*)

Following information is latest received.

Ayr (AARG)—Community Centre, 24 Wellington Street, Ayr. Sec GM3THI.

Dumfries (D&DARG)—Details from GM3WOJ.

Falkirk (Stirlingshire ARG)—Details from GM4DGT.

Glasgow (West of Scotland ARS)—Fridays; 18 January ("144MHz dx" by GM8DMZ), 1 February ("RTTY" by GM8PSM), 15 February ("SSTV" by GM8BKE), other Fridays (Chat nights). 22 Robertson Street, Glasgow. Further details from sec I. McGarvie, 3 Kelso Avenue, Paisley. A new multimode 144MHz rig has been installed in the shack, to work alongside the club's hf equipment. New members welcome.

Greenock (G&DARC)—Tuesdays and Fridays, 7.30pm. 22 Inverkip Street, Greenock. Details from sec GM3LYI.

Helensburgh (HARC)—Try GM4FEO for information.

Motherwell (Mid-Lanark ARS)—Alternate Fridays, commencing 2 March 1979, 7.30pm. Wrangholm Hall Community Centre, Jerviston Street, Motherwell. RAE and morse classes every Friday. All details from sec GM4FKD.

Stevenson (Ardeer RCARS)—Details from GM3SUL.

Stirlingshire (SARG)—New group! Starting up initially to put a 70cm repeater on the air. Anyone welcome to join including members of the diminished Falkirk & District RC, to enlarge club activities. Details from sec GM3POK, or GM4CXF.

Offer of the use of premises, comprising lecture room, committee room and shared use of a workshop, on any day except Thursday and Saturday. Any interested parties please contact ASTRA Ltd, 49 Almada Street, Hamilton. (Opposite Bell College and court building.)

REGION 15—RR I. J. Kyle, GI8AYZ, 2 Galgorm Gardens, Ballymena, Co Antrim BT42 1BA.

Ballymena (BRC)—Tuesdays, (RAE and morse classes), 7pm. Fridays (Club night). Sundays (Special projects), 3pm. 86 Old Cullybackey Road, Ballymena. Sec GI4HCN.

Bangor (B&DARS)—First Friday in each month, 8pm. Redcliffe Hotel, Bangor. Sec GI4AAM.

Belfast (BRSGBG)—Third Wednesday in each month; 16 January ("Variations on a theme" by L. Lyske, GI3CDF), 20 February ("Deviation and all that" by J. McCullagh, GI4BWM), 8pm. 90 Belmont Road, Belfast. Details from GI3USS.
Belfast (CoBYMRC)—Tuesdays, 7pm; Saturdays, 2.30pm. 12 Wellington Place, Belfast. Sec Paul McTaggart, 14 Thirlmere Gardens, Belfast BT15 5EF.
Belfast (Queen's University of Belfast RC)—Tuesdays during term, 7pm. Morse and RAE tuition available. Queen's University, 37 Fitzwilliam Street, Belfast. Sec GI4FVM.
Dromore (Lagan Valley ARS)—Second Monday in each month; 14 January (AGM), 8pm. Scout Hall, Mossvale Road, Dromore, Co Down. Details from AR GI4GDV.
Londonderry (North West Ireland ARS)—First Thursday in each month, 7.30pm. Technical College, Strand Road, Londonderry. Sec GI8MOA.
Mid-Ulster (MURSGBG)—First Sunday in each month. GI4BAC's QTH. Details from AR GI8RJW, tel Armagh 524453.
North Ulster (NURSGBG)—Now reconstituted. Details of meetings from GI4HVI, GI8JTS QTHR.

REGION 16—RR M. S. Appleby, G3ZNU, 45 Cedar Avenue, Kesgrave, Ipswich IP5 7HA. Tel Ipswich (0473) 622559.
Braintree (B&DARS)—First and third Mondays in each month; 7 January (Informal), 21 January ("Receiver design" by B. Oughton, G4AEZ, of Plessey UK), 4 February (Informal), 18 February ("Early days of ssb", slide lecture by S. Chrees, G3DZW, of the IBA), 7.30pm. Braintree Community Centre, Victoria Street, Braintree. Further details from D. Boniface, G3ZXX, 10 Shortridge Court, Hatfield Road, Witham.
Bury St Edmunds (BStERS)—Third Tuesday in each month, 7.30pm. Red Cross Headquarters, Mustow House, Eastgate Street, Bury St Edmunds. Details from John Munro, 29 Angel Hill, Bury St Edmunds.
Chelmsford (CARS)—First Tuesday in each month, 7.30pm. Marconi College, Arbour Lane, Chelmsford. Details from A. Mead, G8KQE, 9 Abraham Drive, Silver End, Witham.
Colchester (CRA)—Thursdays, fortnightly, 7.30pm. Main Block, Colchester Institute, Sheepen Road, Colchester. Details from Frank Howe, G3FIJ.
Felixstowe (FARC)—Tuesdays; 8 January (AGM), 8pm. Felixstowe Golf Club. Details from John Hobin, G3XIX.
Great Yarmouth (GYRS)—Last Thursday in each month, 7.30pm. 67 Southdown Road, Great Yarmouth. Details from Tony Besford, G3NHU.
Harlow (H&DRS)—Tuesdays, 8pm. Mark Hall Barn, First Avenue, Harlow. Details from sec Dan Evans, G4HFR, 17 Alsa Gardens, Elsenham, Bishop's Stortford, Herts CM22 6HD, tel 0279 812300.
Harwich (H&DRA)—Thursdays, 7.30pm. Harwich Adult Education Centre. Details from sec Tony Free, G4EYE.
Haverhill (H&DRS)—Fridays, 7.30pm. Steeple Bumpstead Road, Haverhill. Further details from Chris Kitchener, G8IMI, tel Haverhill 2852, evenings.
Ipswich (IRC)—Second and last Wednesdays in each month during school term; 9 January ("Submarine cables" by D. Munro), 30 January ("Construction of an hf beam" by Pat Gillen, G4GVW), 8pm. Morse classes also available. Handford House, Ranelagh Road, Ipswich. Further details from Jack Tootill, G4IFF, 76 Fircroft Road, Ipswich.
Loughton (L&DARS)—Fridays, fortnightly, 8pm. "Loughton Hall", Rectory Lane, Loughton. Further details from sec John Ray, G8DZH, tel 01-508 3434, evenings.
Lowestoft (L&DARC)—Fridays, 7.30pm. North Suffolk Teachers' Centre, Lovewell Road, Lowestoft. Details from Paul Godfrey, G8JBD.
Martlesham (MRS)—First Wednesday in each month, 7.30pm. PO Research Centre, Martlesham Heath, Ipswich. Visitors always welcome but must first contact Simon Garrett, G4EVN.
Norwich (Norfolk ARC)—Wednesdays, 7.45pm. Crome Community Centre, Telegraph Lane East, Norwich. Details from Peter Forster, G3VWQ.
Southend (S&DRS)—Fridays, fortnightly, 8pm. Church Hall, Sir Walter Raleigh Drive, Rayleigh, Essex. Contact sec G3YOA.
Stowmarket (S&DARS)—First Monday in each month, 7.30pm. Red Cross Hall, Stowmarket Railway Station. Details from Ray Preston, G8MYE.
Thurrock (TARC)—First and third Tuesdays in each month, 8pm. Grays Park Hall, Orsett Road, Grays. Morse tuition available. Details from sec G3KMD. Club net on 144MHz S21/22, on second and fourth Tuesdays in each month, 8pm. New members and visitors welcome.
Vange (VARS)—Thursdays, 8pm. Main Hall, Barstable Tenants' Community Association, Long Riding, Basildon. Details from Mrs D. Thompson, 10 Feering Row, Basildon SS14 1TE.

REGION 17—RR H. G. Cunningham, G8FG, 235 Station Road, West Moors, Wimborne, Dorset BH22 0HZ. Tel Ferndown (0202) 876018.
Basingstoke (BARC)—Third Wednesday in each month, 7.30pm. Chineham House, Popley Way, Basingstoke.
Basingstoke (UK FM Group Southern)—First Wednesday in each month. Chineham House, Popley Way, Basingstoke. Details from pro Mrs Jan Payne, 12 Meadow Way, Aldershot, tel Aldershot 26108, after 4pm.
Bournemouth (BRS)—First and third Fridays in each month, 8pm. Dolphin Hotel, Holdenhurst Road, Bournemouth. Sec Bob Freeth, G4HFQ, tel New Milton 618092.
Chippenham (C&DARC)—Tuesdays, 7.30pm. Sheldon School, Hardenhuish Lane, Chippenham, Sec P. J. Tuck.
Fareham (F&DARC)—First and third Wednesdays in each month, 7.30pm. Porchester Community Centre, Room 9. Sec David James, G8GRV, tel Titchfield (03294) 45977.
Farnborough (F&DRS)—Second and fourth Wednesdays in each month, 7.30pm. Railway Enthusiasts' Club, Access Road, off Hawley Lane, Farnborough. Sec G3TMQ, 103 Hawley Lane, Farnborough.
Guernsey (GARS)—Tuesdays and Fridays, 8pm. Details from sec GU8ITE, PO Box 100, St Peter Port, Guernsey.
Horndean (H&DARC)—Second Thursday in each month, 7.30pm. Merchiston Hall, Horndean. Net Thursdays, 7.30pm 28·4MHz; and 8pm S16. Sec V. Lear, G3TKN, 18 Alten Road, Waterlooville, Hants.
Jersey (JAEC)—Details from sec, tel 0534 23249.

Mr D. Cornish, G3COR, RSGB hon treasurer, being presented with a bottle of champagne by Mr G. Brown, GJ4ICD, convention organiser, at the Jersey Radio Convention held in September. Seated on the right is F8OB, president of Dept 35 for REF. ***Photo:*** **GJ8KNV**

Jersey (JARS)—Sundays, 10.30am, and Fridays, 8pm. Le Hocq Tower, St Clement, Jersey. Sec R. H. Ford, "Sanaldi House", Plat Douet Road, Bagot, St Saviour, tel 0534 31131.

For the second year in succession, the Jersey ARS, on behalf of the Lions Club of Jersey, has won the international contest between Lions clubs, called "Hunting Lions in the Air", for ssb operation. The contest was for the number of contacts in a specific 24-hour period between members of Lions clubs or amateurs operating on their behalf.

Operating from their martello tower headquarters at Le Hocq, the Jersey ARS made contact with stations in North and South America, the Far East and Europe in this, their second entry in to contest. The photograph shows Mr C. Smith, the Jersey Lions president, presenting the scroll and trophy to Mr H. Chater, GJ2LU, Jersey ARS president.

Poole (PARS)—Last Friday in each month, 7.30pm. Poole Technical College. Sec Phil Ciotti, G3XBZ, 214 Rossmore Road, Parkstone, Poole.
Portsdown Hill Repeater Group—Activity night on GB3PH (RB2), Mondays, 8.30pm. All stations welcome to the net. Details from G8GNB.

L to r: Mr C. Smith; GJ8PKU, chairman, Jersey ARS; GJ3YLI; GJ2LU and GJ4HSW. In the background is the Jersey ARS headquarters. ***Photo:*** **courtesy of Jersey** ***Evening Post***

Portsmouth (P&DRC)—Wednesdays, 7.30pm. Portsmouth Community Centre, Malins Road, Buckland, Portsmouth. Sec A. C. Cake, G3CNO, 7 Wheatstone Road, Southsea.
Salisbury (SR&ES)—Tuesdays, 7.30pm. Salisbury Activity Centre, Wilton Road. Sec G2FIX, 74 Victoria Road, Wilton, Salisbury.
Southampton University (SUARC)—Tuesday evenings. Also informal meetings every lunchtime in the clubroom, Old Union Building. Sec A. C. Talbot, The Radio Club, JCR Post, The University, Southampton.
Southampton (SRSGBG)—First Monday in each month. Lanchester Building, Southampton University. Wednesdays. The Clubroom, Kent Road. Both at 7.30pm. AR J. R. Compton, G4COM, Aysgarth, Beech Corner, Durley Brook Road, Durley, Southampton.
South Dorset (SDRS)—First Tuesday in each month, 7.30pm. Lecture Hall, South Dorset Technical College, Newstead Road, Weymouth. Sec John Nailer, G4CFY, tel 0305 5411.
Swindon (S&DARC)—Alternate Wednesdays, 7.45pm. Clubroom, Oasis Leisure Centre. Sec K. Clinch, G8OQY, 13 Pound Piece, Ashbury, Swindon.
Winchester (WARC)—Third Saturday in each month. The Scout Log Cabin, Stockbridge Road, Winchester. First Friday in each month (Informal). Crown Hotel, North Walls, Winchester. Both at 8pm. Sec Peter Simpkins, G3MCL, Lawn End, Park Road, Winchester.

REGION 18—RR W. A. Ricalton, G4ADD, 4 South Road, Longhorsley, Morpeth, Northumberland.
Following information is latest received.
Durham (DURES)—During term. Physics Dept, Science Site, Durham University. Details of events from G3ZJY, G4FOP, or sec I. P. Jefferson, BRS41816, Grey College, Durham. External members especially welcome.
Easington (EAR&EC)—Tuesdays and Thursdays, 7.30pm. Easington Village Workmen's Club. RAE and morse tuition if required (the club has a good pass record). Details from sec G4GXI. All welcome.
Great Lumley (GLAR&EC)—Alternate Wednesdays, 7.30pm. Great Lumley Community Centre. RAE and morse tuition if required. Sec G4DWM.
Hartlepool (HRC)—Mondays, 7.30pm. Methodist Church Hall, Grange Road. Sec G3NWU.
Middlesbrough (Post Office ARC)—All amateurs welcome, but first contact sec G8CDP.
Middlesbrough (Teesside Repeater Group)—Last Tuesday in each month, 7.30pm. 196 Marton Road, Middlesbrough, Cleveland. All amateurs and swls invited but first contact sec G8MBK.
Morpeth (Northumbria RC)—Thursdays (Informal). Queens Head, Morpeth. Sec G8GVN.
Newcastle Upon Tyne (Tyne & Wear Repeater Group)—Arts Common Room, Claremont Tower Block, Newcastle University. Sec G4DOB, tel Newcastle 744444.
South Shields (SS&DRS)—Fridays, 7.30pm. Trinity House. Old and new members welcome. Sec G8BQF, 67 Lauderdale Avenue.
Tyneside (TRS)—Mondays, 7.30pm. The Community Centre, Vine Street, Wallsend. Morse tuition can be arranged. Sec G8OFA, 69 Rectory Lane, Blaydon-on-Tyne. New members welcome; club equipped for multiband operation.

REGION 19—RR R. J. C. Broadbent, G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ.
Barking (BR&ES)—Every weeknight (Mondays to Fridays), 7.30pm. Westbury Road School, off Ripple Road, Barking, Essex. All welcome at any meeting.
Central London (Post Office HQ ARG)—Third Thursday in each month (Lectures), 5.30pm. Location varies. First Thursday in each month (Bar socials), 12–2pm. Central London. For specific details of this group, for members of PO only, contact P. H. J. Houseago, G8SGB, tel 01-388 6161 ext 202 or 204.
Cheshunt (C&DRC)—Wednesdays; 2 January (Natternight), 9 January (Rig clinic), 16 January ("28MHz fm" by G3YPZ), 23 January (Film "Tour of West Indies" by G3RWL), 30 January (Natternight), 6 February ("If you can't beat 'em—join 'em" by G3NEE), 13 February (Natternight), 20 February ("NZ" by G8IFC), 8pm. Church Room, Church Lane, Wormley, Herts. Sec Roger Chastell, G8LNM.
Chingford (Silverthorn RC)—Fridays, 7.30pm. Friday Hill House, Simmonds Lane, Chingford E4. Sec G4AJA, tel 01-529 2282. All visitors welcome.
Chiswick (Acton, Brentford & Chiswick RC)—15 January (AGM; and "My QRP rig" by G3YXB), 19 February ("Test equipment for blind ops" by G3IIN), 7.30pm. Chiswick Trades and Social Club, 66 High Road, Chiswick W4. Hon sec G3GEH, tel 01-992 3778.
Ealing (E&DARS)—Tuesdays, 8pm. Northfields Community Centre, Northfields Road, London W13. Hon sec E. Batts, G8LWY, 27 Cranmer Court, Richmond Road, Kingston Upon Thames. All welcome.
East London (ELRSGBG)—Third Sunday in each month, September to May; 20 January ("Radio astronomy" by Ken Smith, G3JIX), 17 February ("PCB design" by J. Hooper, G3PCA), 16 March ("Micros" by G3AAJ, the non-expert), 3pm. Wanstead House, The Green, Wanstead, London E11 (near Wanstead underground station). Hon sec G3PKQ, tel 01-558 2928. All are welcome.
Edgware (E&DRS)—Second and fourth Thursdays in each month; 10 January (AGM), 24 January (Informal), 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware. Sec Dennis Lisney, G3MNO, tel 01-907 1237. Club callsigns G3ASR and G8ERS. All radio amateurs welcome at all meetings.
Harrow (RSH)—Fridays, 8pm. Harrow Arts Centre, High Road, Harrow Weald. (Bar, car park—park neatly.) Hon sec G4AUF, tel 01-868 5002.

On 4 October the Radio Society of Harrow had the honour of meeting HM King Hussein of Jordan, JY1. About 50 of the club's 120 members, together with a number of xyls and yls, met the king in the Harrow Civic Centre at a reception kindly arranged by the Mayor of Harrow.

King Hussein is an ex-Harrow School pupil, and because of his past links with the borough he readily accepted the society's invitation to became an honorary member in 1971. The Radio Society of Harrow wishes to thank the king for sparing the time to meet his fellow members, and hopes that he will attend further society meetings in the future.

Havering (H&DARC)—Wednesdays, 8pm. Fairkytes Art Centre, Billet Lane, Hornchurch (opposite New Queens Theatre). Details from A. G. Negus, G8DQJ, tel Upminster 24059.
Holloway (Grafton RS)—Fridays, 8pm. Holloway Institute, Archway Annexe, Highgate Hill, London N19. Details from sec B. Bond, G3ZKE.
Ilford (IRSGBG)—All meetings are informal. 50 Mortlake Road, Ilford, Essex. Sec. G3LRE, tel 01-500 7196.
St Albans (Verulam ARC)—Fourth Thursday in each month, 7.30 for 8pm. Jubilee Centre, Catherine Street, St Albans. Second Thursday in each month, October to April, (Informal). RAFA HQ, Victoria Street. Hon sec A. Clarke, G8MAE, tel 0442 64751. All welcome.
Shelburne (SRC)—Thursdays, 7pm. Shelburne Youth Centre, Hornsey Road, London N7. RAE courses available. Hon sec T. C. Clark, G4BZW, tel 01-249 1843. Sec would be pleased to hear from any prospective members. The club has a 2000E transceiver, and G5RV for licensed members to use.
Southgate (SRC)—Second Thursday in each month; 10 January ("Microprocessors"), 14 February (Talk by RAIBC; and "·– to —·· of cw practice and technique" by Ron Lindsay, G3KTZ), 13 March (Frequency counter—the club project), 7.45pm. The Scout Hut, Wilson Street, Winchmore Hill Green, London N21. Sec John Fitch, G8EWG, tel 01-440 7353. All newcomers welcome.

Seen here with King Hussein during his visit to Harrow are (l to r): Bill Corsham, G2UV; Norman Joly, G3FNJ; Mayoress Mrs Sheila Rouse; The mayor of Harrow, Clr Derrick Rouse; HM King Hussein of Jordan, JY1; Geoff Hodges, G3KRT (treasurer, RSH); Chris Friel, G4AUF (secretary, RSH); Don Nappin, G3MLS (chairman, RSH); Maynard De Borde (president, RSH). *Photo:* courtesy of *Harrow Observer*

South West Herts UHF Group—The building of GB3BH (1·3GHz/beacon/repeater) is progressing, and the group's 10GHz beacon, GB3SWH, is now operational. Reports are requested from as many amateurs as possible to evaluate GB3SWH's catchment area. Talks can be arranged for interested groups. Contact hon sec G8BBE.
Stevenage (S&DARS)—First and third Thursdays in each month; 3 January (Talk by Frank Collett, G3OVT), 17 January ("RTTY" by D. Beattie, G3OZF), 7 February ("On the Isle of Skye", talk with slides by P. Hipkin, G8KMG), 21 February (N Herts Raynet AGM), 26 March (AGM), 8.15pm. Senior Staff Canteen, British Aerospace, Gunnels Wood Road. For information contact P. Byrne, G8MCV, tel 0438 64624.
UK FM Group (London)—Second Tuesday in each month, 8pm. It was announced in September "Club news" that the club has had difficulty in finding a new venue. Apparently this is still the case, so, for information, members and others should contact sec Chris, G4EVA.
West Drayton (LT District Line ARC)—Thursdays, 6pm. DLAA Sports Ground, Park Place, Gunnersbury Avenue W3. (Bar). This club requires the attendance of former members, who lost interest, to enable the club to survive. It would also like the assistance of local amateurs who could give talks on any radio topic. Hon sec R. Ball, G8JEB, tel 01-422 0414. Club net 144·250 ssb, 2000–2100 local.

Only five club secs sent in details before the posting date: please check the copy date to RRs at beginning of "club news"—*RR19.*

Peter Martinez, G3PLX (centre), was guest speaker at the Verulam ARC meeting in October, when he spoke on microprocessors in amateur radio. With him are Dave Wicks, G3YYD, and Brian Pickford, G4DUS. *Photo:* G3PZF

REGION 20—RR G. Mather, G3GKA, 8 Hills Close, Keynsham, Bristol. Tel Keynsham 61625.

Bridgwater (HPSSARS)—Second Monday in each month, 7.30pm. YMCA, Nr St John Ambulance Hall. Further details from G4ETN.
Bristol (BARC)—Tuesdays, 7.30pm. The University Settlement, Barton Hill, Bristol 5. Sec G8KGE.
Bristol (BRSGBG)—28 January (AGM), 25 February ("More circuits" by G3JMY), 31 March (Talk by G8FNR), 7-9.30pm. Small Lecture Theatre, Queens Building, University Walk, Clifton, Bristol. Hon sec G4FRG.
Bristol (North Bristol ARC)—Tuesdays (with RAE instruction), 7pm. Lockleaze Community Association, Romney Avenue, Lockleaze, Bristol. Hon sec G2BSU.
Bristol (Shirehampton ARC)—Fridays, 7pm. Twyford House, Shirehampton. Hon sec G4GTD. HF and vhf station all modes, lectures and films, df hunts etc, planned for 1980. RAE and more classes in progress. New members welcome.
Cheltenham (CARA)—First Thursday and third Friday in each month. "The Old Bakery", Chester Walk, Cheltenham. Hon sec G8MZV.
Gloucester (GARS)—Thursdays; first Thursday in each month (society business followed by a talk), remaining Thursdays (activity nights with G4AYM in operation), 7pm. Chequers Bridge Centre, Painswick Road, Gloucester. Hon sec G3MA.
North Avon Repeater Group—Provisionally GB3AA at Alveston, Avon. Group meets on an *ad hoc* basis. Further information from G8NNU.
Weston-super-Mare (WsMARS)—Second Monday in each month, 7.30pm. Lewis Block, Worle Comprehensive School, Redwing Drive, off Mead Vale, Weston-super-Mare. Hon sec Irvin Barr-Sim, The Old Dairy, Eastertown, Lympsham, Somerset.
Yate (Y&DARC)—First Friday in each month, 8pm. G3RQN QTH. Further details from G8LGC. All welcome including swls.
Yeovil (Y&DARC)—Thursdays; 24 January (Quiz), (Lectures most weeks), 7.30pm. Building 101, Houndstone Camp, Yeovil (off A3088). Hon sec G3NOF. Club net 10.30am Sundays, 3·660MHz.

My diary for 1980 is being prepared; will hon secs please contact me to agree dates for club visits—*RR20.*

members' ads

These subsidized flat-rate advertisements are accepted as a service to members of the RSGB. They must be submitted on the Members' Ads order form printed in alternate issues of *Radio Communication*, or on a postcard similarly laid out. Each **must** be accompanied by a **recent** *Radio Communication* mailing label addressed to the advertiser, as proof of membership, and a remittance by postal order or cheque for 75p (stamps not accepted) for every 40 words or part thereof. They will not be acknowledged. Those not clearly worded or punctuated will be returned. No correspondence concerning this service can be entered into.

Closing dates in 1980 for issues in brackets: **25 January (March), 29 February (April), 28 March (May), 25 April (June), 23 May (July), 20 June (August), 18 July (September), 29 August (October), 26 September (November), 24 October (December), 21 November (January), 19 December (February).**

Trade or business advertisements, even from members, will not be accepted for Members' Ads but should be submitted as classified or display advertisements in the usual way. Traders who are members must enclose a signed declaration that the items for sale or wanted are part of, or intended for, their own personal amateur station.

The RSGB reserves the right to refuse advertisements, and accepts no responsibility for errors or omissions or for the quality of goods offered for sale. Advertisements may be edited or abbreviated as necessary.

Advertisements for 27MHz equipment will not be accepted.

Post to: MEMBERS' ADS, RSGB, 88 BROOMFIELD ROAD, CHELMSFORD, ESSEX CM1 1SS.

Do not post to RSGB HQ or Advertising Representative

FOR SALE

Icom IC22A, comp 2m fm stn, 11ch fitted, c/w mobile mounting bracket, commercial psu, 8-el Yagi, ASP λ/4 mag mount mobile whip, £150 ono. G4IIB. Tel Newcastle upon Tyne (0632) 674623.

IC215, 2m, portable, channels S0, S11, S20–22, R3–7, R9, telescopic whip, helical, shoulder strap, handbook, circuits, good cond, orig packing, for quick sale, £90. G8NVS, QTHR. Tel Simon, Wickersley (070984) 4343, evenings/weekends.

FT202R hand-held 2m tx/rx, in perfect cond, with all accessories as supplied, only three months old, incl external mic/spkr YM24, xtalled on S20–23, S18, R5, £125. G3KLF. Tel Fareham 236906, weekends or evenings please.

FT200/FP200, fitted all of 10m, orig packing, manual, not used mobile, £220. Pair Pye Pocketfones, xtalled and wkg on SU8, no batts, £20 ono. Brown, 14 Bernard Road, Cromer, Norfolk.

FTDX401, good cond, spare valves, incl pa, £270. G3SYC, QTHR. Tel 0977 77653.

5B/254M (min 807), £1.50 ea. 829, £2.50 ea. 832, £2 ea. Cossor 89J crt, £6.50 ea. 815, £2 ea. EF50, 50p ea. 1625, £1.25 ea. Various octal valves available, state requirements. Some bases available. Postage extra. G3LHN, QTHR. Tel Bookham 57837.

Drake R4 amateur bands rx, seven extra xtals, spare set valves, manual, covers six hf bands (160 through all 10m), switchable selectivity, variable pass-band and notch controls, separate rf/af gain controls, S-meter, exc, £150 ono. Tel Frome (0373) 4694.

Trio TR2200G, charger, orig packing, eight xtals, £110. *Radio Communication,* 1968 to present, best offer secures. GW4DTV, 7 Neyland Vale, Neyland, Nr Milford Haven, Dyfed, S Wales. Tel 0646 600869.

100W solid-state commercial linear, mint, 12V, 10–80m, rx preamp, auto t/r, £95. 14-el Parabeam, £15. MMT 144/28 2m transverter, mint, £60. 6ft deluxe 19in rack, mint, enclosed, £10. G3VZJ, QTHR. Tel Reading (0734) 413891.

400W/GG linear, newly built, £110. Cambridge, 2m, fm/a.m., front panel controls, spare valves, £35; heavy-duty psu, to suit, £12. Homebrew transverter, 7/1·8MHz, spare set new valves, £40. SAE enquiries, buyer inspects/collects. G3DVL, QTHR. Tel 0273 71862.

Get started on rtty: ST5 send receive terminal unit, rear panel sockets for auto sender, vdu output and cw id, comp with Creed 7E printer, both exc cond, £40. Buyers to collect. G4FLY, QTHR. Tel 0734 594495.

KW Vanguard cw/a.m. phone tx, 80, 40, 20, 15, 10m bands, £25. AM modulator, pair 807s, output mu metal, mic, transformer, speech clipper, rack panel mounted, £10. G3BOM, 15 Pendle Drive, Basildon, Essex SS14 3LS. Tel Basildon (0268) 285567.

G2DAF tx, £25. Weston megohm meter, £5. 10m to 4m transverter, £15. 3–6MHz command rx, £6. BC348, 200kHz–18MHz, £10. RF sig gen, £3. 2m 8+8 antenna, £8. *Microwave Engineers Handbook,* £2. G3UFW, QTHR. Tel Romsey 515884.

KW Atlanta, vgc, recent recon by Decca, new pas, extractor fan and cw side-tone fitted, £150. Eddystone EC10 Mk1, £50. Standard 828M, 1W/10W, mobile mount, mic, leather carry case, fully xtalled, £130. G4HIY. Tel Lincoln (0522) 720414.

TS700G, mint, orig packing, £350. Pair Pye PF1s, on RB14, plenty nicads, 12-way charger, £40. Electroniques g/c front end, 1·6MHz i.f., £30. GM3RXU, QTHR. Tel 041-884 5365.

FT101 Mk2, 160–10m (+11m), mic, 12V dc, 250V ac, leads, vgc, no mods, no mox so £240. Mosley 10–20m 3-el beam, £48 ono; or swop for vertical, w.h.y.? *Wanted:* VU2BZ QSL cards, op pre-1944 Royal Signals Rawalpindi (my om), all post refunded. G4DXX, QTHR. Tel David, 0524 73 4274, after 7pm please.

Valves, Eimac 100th 53A, Raytheon 715B, TT15, QVO6/20, GEC carbon anode triode, size like 211, all ex-equipment but believed new, offers. *Wanted:* HRO coils, xtal filter, etc. G5ND, QTHR (Lancs). Tel 0253 64508.

FDK Multi 700E, as new, orig packing, nine months old, £190. Tel Andy, Bedford 781970, evenings and weekends.

Atlas 210X, comp with console psu and spkr, cond as new, £395. Antron fet multimeter, new, normally £20, £14. Duckworth, G4BG. Tel Salisbury 5379.

23cm comp stn, comprising Yagi with feeder preamp BFR91, spare BFR91, c/o relay, rf sniffer with microammeter, MM converter, MM varactor tripler, 2C39 pa, three spare 2C39s, all BNC connecting cables, £100. Buyer collects. G5DF, QTHR. Tel Wensleydale (0969) 22444.

Vortexion WVA series 5 semi-professional reel-to-reel tape recorder, vu meter, accepts up to 8½in diameter reels, 7½ and 15in/s, handbook, connecting leads, six reels of tape, exc cond, £60 ono. Carr extra. G3JHL, QTHR.

Liner 2, exc cond, £90. E. R. Robson, GD4IHA, 13 King Edward Park, Onchan, Isle of Man. Tel Douglas 24808.

IC-RM3, new Sept, £85. Sentinel 2m converter, i.f. mw, £10. Jaybeam 5λ/8 mobile antenna, £5. AF valve amp, 6W, £5. 6/6 slot, 50Ω, used, £7. 4-el 2m 75Ω, used, £5. GPO telephone, £5. Scopex 4S6 'scope, £85. G8ESK, QTHR. Tel Bradford 45611.

Eddystone 730/4, exc cond, £80. Diamond vertical 80/40 antenna, comp with loaded radials, only occasionally used experimentally, mint, £15. G4HKL, QTHR. Tel 044 284 3474.

Trio TS700, preamp, xtals, £295; KW107 Supermatch, £35; KW low pass filter, £5; FV101B vfo, £50; YO100 'scope, £95; KW swr meter, £7.50; Tiger Radio antenna coupler, £10; all perfect wkg order, manuals. G3KDH, QTHR. Tel Tring 3505.

Pye Vanguard AM25T, mods for fm rx, fully tunable a.m./fm/ssb, £45. Heathkit Mohican, £25. Tonna 16-el portable 2m beam, £25. 50W 2m pa, QM70, £35. Avo 8 meter movement, £3. Buyer collects. G8KLV, QTHR. Tel Chippenham 50880, after 6pm.

IC202, 144·0–144·4, nicads, as new, boxed, £145. 40ft free-standing lattice tower, with integral climbing steps, £45. Can deliver reasonable distance. *Wanted:* 2- or 3-el triband hf beam, suitable rotator. G4HPN. Tel Bradford (0274) 585387.

FT225R, 10 months old, little used, xtals 20–23, orig packing, may be seen in Manchester, £500 ono. GI4IBD. Tel Belfast 621148.

RAIC trap dipole, 2kW rating, 80–10m, unused, sealed, handbook, 10m 52Ω feeder, £15. MMC 144/28 converter, £15. MMC 70/28 converter, £15. 5XY/2M 5-el Yagi, Xd polarized, £10. MBM 48/70cm multibeam, £15. Telford TC7, 28–30 i.f., tunable, psu, fm, ssb, psu audio-spkr, manual, £30. G4FQP, QTHR. Tel 0602 720794.

TS520, used very little, as new cond, boxed, £400. G4HTE. Tel Potters Bar (0707) 54905.

US Navy gen purpose 'scope, type USM38, 10Hz–6MHz, sweep expansion, brand new, comp all probes, connectors, manual, top quality instrument, £85. PSU for R1392, brand new, £8, plus carr. British and American technical manuals: Collins, Eddystone, etc; sae list. G3GUU, QTHR.

KW201 xtal calibrator and multiplier, late models, mint cond, manuals, £145. Key Electronics 144MHz 2·5W cw transistor tx, keying board, £15. FV50B, mint, £30. Cash sales, buyer collects. *Wanted:* FR50B; FL50B; manuals. G3FK, QTHR. Tel Breamore 436.

Tektronix double-beam 'scope, type 524, new set spare valves, tube, instruction manual, £50. Buyer arranges collection. G4CEY, QTHR. Tel Elton 355.

Homebrew 2-el 15m quad, £15; Hy-Gain 14AVQ, £35; both ono. G3VQQ, 20 Bude Road, Bradford. Tel 0274 307523.
Trio 9R59DS hf rx, exc cond, manual, £48. Can possibly del Berks or Staffs. Tel Phil, Bracknell (0344) 53303.
Collins S-line 75S-3B rx, 32S-1 tx, 30L-1 linear, 516F-2 power supply, SM-1 mic, all manuals and cables, perfect wkg order, demo arranged for interested purchaser, £1,000. G3KDH, QTHR. Tel Tring 3505.
Trio 2200GX, hi-low charger, nicads, fully xtalled, exc cond, £130. HW8, no mods. G4FKL, QTHR. Tel Sunderland 73350.
FT221RD, as new, £325. TS515 hf tx/rx, little used, £220. PF1 tx/rx, on RB2, nicads, charger, £35. 2m 4CX250 linear, psu, £65 ono. G3NPZ, NOT QTHR. Tel Fareham (0329) 283736, after 5pm.
SB220, £400. Ham M rotator and control box, £100. FT501 digital tx/rx, c/w FP501, £400. G8FG, QTHR. Tel Ferndown (0202) 876018.
Clearing stn: Heathkit RA1 rx, modified, £15; SB10 sideband adapter, £20; QPM16 Q-multiplier, £4; LM11 frequency meter, mains psu, £20; A Mk3 suitcase tx/rx, psu not wkg, £15; homebrew tx, Geloso vfo, 2×6146 linear, £10. GM3GTQ, QTHR. Tel 041-942 3061.
Heathkit SB610 monitorscope, as new, full tune-up facilities for all modes incl ssb, built-in two-tone oscillator, receiver monitor and normal 'scope facilities, comp with manual, £40, plus carr. GW8NP, QTHR. Tel 0222 68768.
Belcom 2m, cw facility, comp with mic, handbook, mobile mount, Revco 2m antenna, mint cond, £100 ono. C4 10–20 antenna, mint, £30, carr extra. AR88LF, £50; collect only, or exch w.h.y.? G3SGH. Tel Ashford (Kent) 21158.
12AVQ type three-band vertical antenna, property deceased amateur, good cond, £25. *Wanted:* valves, type 6KE8, 6GH8, 6GK6, 6BZ6, 7360, 6GJ5, 6JB6. G3OEI, QTHR.
TR2200GX, R4, R6, R7, S0, S20, S22, nicads, charger, helical whip, case, auto toneburst, mobile mount, 7W mobile pa, VFO30G matching vfo, all in orig boxes, £180. G8EPQ, 4 Prince of Wales Close, Wisbech, Cambs PE13 3HN. Tel 0945 63614, evenings.
FT221 all mode 2m tx/rx, mint cond, £295. Eddystone 840C g/c ham band rx, mint cond, £85. Eddystone EC10 g/c ham band rx, comp with mains psu, mint cond, £70. Carr extra on all items. G4GQH, QTHR. Tel 0202 522796, after 6pm.
LA106 2m linear, 200W p.e.p. input, £150. Two new 6-el 2m quads, incl phasing harness, £45. Trio VOX3, £10. Datong RFC speech clipper, £25. G3KEQ, QTHR. Tel 01-657 1847, after 6pm.
Belcom Liner 4-30 70cm sideband tx/rx, incl Belcom R115E psu, £170. Walters, G8JGF, QTHR. Tel Ripley 0773 810280.
TS520, new, boxed, mic, accessories, etc, £425. Large high-quality roller coaster, brand new, in sealed carton, £16. Avo 8X Panclimatic model, test leads, manual, mint, in orig packing, £65. Collect or carr extra. Tel 0995 40387.
Atlas 210X, 80–10, for shack or mobile, noise blanker, h/b psu, stabilized, fb cond, £300, plus carr. GW3GAH, QTHR (Anglesey). Tel Tynygongl 2761.
Trio 9R59DE, Trio spkr, handbook, service sheet, £42. CR100, front needs respray, functional, very tatty, handbook, £5. Buyers collect. G8PAQ, 15 Egghill Lane, Northfield, Birmingham. Tel 021-475 7119.
Datong rf clipper, as new, £35. 100kHz transistorized standard QCC gold-plated 5X cut bar, £10. Emsac 2m fm tx, little used, £50. Postage extra. Numerous valves to clear, many boxed, unused, UX, IO, B9, etc, sae for list, price. *Wanted:* psu; mod unit for LG300. G3FPJ, The Bannuts, Broad Hempston, Totnes, Devon.
TR2200GX, R0, R2–7, S17, S19–22, plus xtals for S15, R0 rev tx and rx, R5 rev rx, case, nicads, charger, power lead, handbook, £135 ono. Moore, G8SNO. Tel 021-308 2458.
Westminster W15U 10ch 70cm tx/rx, 6W, on RB0, RB2, RB4, RB6, SU8, RB10, RB14, SU20, control box, toneburst, mic, harness spkr, wkg perfectly, £135. *Wanted:* good AR88. G3KLF. Tel Fareham 236906, weekends or evenings only please.
Atlas 215X, incl mobile mount, £300. Golden Eagle mic, £40. Sony TC229SD front load stereo tape deck, £85. C Scope BFO60 metal detector, £26. G4EPN, QTHR. Tel Sapcote 3404.
HW8 tx/rx, 80–15, QRP, cw, matching psu, vgc, good dxer, £120. Prefer buyer tests and collects. G4CQK, QTHR. Tel Walton-on-Thames (09322) 27199.
Western DX34 4-el triband beam, only six months old, gives very good results, will deliver reasonable distance, £90 ovno. G3VWX, Garn Cottage, Craven Arms, Salop SY7 0BT. Tel Knighton Powys (0547) 528657.
Icom IC211E 2m multimode tx/rx, dual synthesized vfo with keyboard controller, as new, orig packing, three months old, going hf only. G4CCW. Tel 01-686 6479, evenings.
IC240 2m fm tx/rx, late model, mint cond, boxed as purchased, mic, handbook, mobile mounts, etc, £169 ono. G3YMW. Tel 0376 40085.
Collector's item, B28 ex-Admiralty rx, 60kHz–30MHz, six band, bfo, avc, exc wkg order, spares, manual, £45; 10m h/b rigs, two types, £10; offers; or w.h.y.? Buyer collects. Hodgkinson, 28 Kings Avenue, Loughborough, Leics. Tel 0509 217500, after 4.30pm.
Portable tv, 14in b & w, 405-lines, also vhf, channel turret snap in/out coil panels, good wkg order, ripe for s/scan conversion, manufacturer's component ref, cct, diag, £15. G4IVE. Tel Southend (0702) 528518.
FT200, FP200, 10–80m, all 10m, mic, £240. Buyer collects or carr at cost. *Wanted:* FT7. G4HZU, 72 Broadsands Avenue, Paignton, Devon. Tel Churston 844407.
Used few hours only, FT221R, AR40 rotator, receive preamp, 20ft alloy mast, Heathkit gdo, 6-el quad, comp stn, £400. Buyer collects. G8KCO, QTHR. Tel 0462 730898.
Liner 2, 8-el Yagi. G8SZY (Luton, Beds). Tel 0582 51695, evenings or weekends.
KW2000, ac psu, £120; Eddystone S750, orig die-cast spkr, £75; both mint. G3UCK, QTHR. Tel Cullingworth 272417.
Creed 7E printer, 240V ac, first class cond, silence cover, spare paper rolls, compact s-state tu, rx only but fsk pcb supplied, giving exc copy, £25. Buyer please collect. G3PY, QTHR. Tel Glossop 61062.
FT101E, one owner, checked by supplier, £425. G2FT, Elton, Dymoke Road, Mablethorpe, Lincs. Tel 3487.
"Wireless World", from 1960, several years; sell or w.h.y.? G8BXO, QTHR. Tel South Molton (07695) 3382, after 7pm.
FT202-R 2m hand-portable tx/rx, channelled S17, S20–22, R6–7, nicads, spare S16 xtals incl, little used, as new. GM8PMN, QTHR. Tel 031-331 2301.
KW202, £140; KW204, vox, £150; both little used, no mods, manuals. G3MUI, QTHR. Tel 0279 57107.
FT200, home-built psu, all 10m xtals fitted, £190. *Wanted:* small tv monitor. G3NKL, QTHR. Tel Longridge 2511.
IC240, £150; matching IC3PA mains psu, incl mounting brackets for IC240, £30; HA202 2m 40/50W pa, £25; all in mint cond, incl accessories, packing, manuals, etc, consider splitting if necessary. Deliver 50 miles. G8CCI, QTHR. Tel Oxford 880229, evenings or weekends.
Realistic DX160 gen cov rx, absolutely mint, six months old, £85 ono. Plustron 7in tu, radio cassette radio combined, portable, mint, three months old, £135 ono. L.D. Ireland, 16 Cathebedron Road, Carnhell Green, Camborne, Cornwall TR14 0NA. Tel Praze 236.
Video tape, Scotch, 1in by 2,460ft, new, unused, two only, £15 ea ono. G8SAE, QTHR. Tel 0562 741080.
Yaesu YD844 desk mic, £10; Yaesu 1kW low pass filter, £10; both as new. 1kW wightraps, unused, £5 pair. 1kW all-band transmatch, cased, £15. G3SEF, QTHR (W Midlands). Tel Cheslyn Hay 415369.
RTTY Creed model 75 teleprinter, comp with technical handbook, £30. G3BXI, Pennyfield, Great Easton, Dunmow, Essex. Tel Great Easton (037 184) 235.
Creed 7B teleprinter, silence cover, re-con carriage, £25. Creed 75RO, governed motor, automatic cr/lf, silence cover, £35. Two 75ROs, sync motor, £20 ea. Spacemark SRD1 tu, £30. Trolley for above printers, £20. Richardson, 9 Derwent Road, Aylesbury, Bucks. Tel 81881.
FT101ZD, the latest from Yaesu, offers or exch, w.h.y.? Mizho 2m ssb/cw hand-held, offers around £110. Microwave Modules 432MHz transverter, offers around £90. G4GKD, QTHR.
IC211E, as new, £485. HW8, irt, xtal cal, £40. MMT 28/144, little used, £65. Joystick antenna, £5. Carr extra. G3TUX, QTHR. Tel Basingstoke 23668, any time.
Heathkit SB401 tx, 3·5–30MHz, 200W p.e.p., £100; Shure 444 mic, £15; BC221 frequency meter, psu, book, £25; 500V megger, offers; Sinclair PDM35 digital multimeter, case, leads, etc, £30; all ono. G3DDK, QTHR. Tel Barnby 774.
FRG7 gen cov rx, vgc, £150. G4IRN (Manchester). Tel 061-865 0456.
Heathkit HW32A and HW12A single-band tx/rxs, psus, Yaesu YD844 mic, good cond, over 90 countries worked, can be seen wkg, the lot, £110 ono. Ideal for new licensees on hf. G4HLN, QTHR. Tel Bristol (0272) 651841, evenings.
PDP8-L 8k minicomputer, tty interface, peripheral expander box, exc wkg order, circuit diagrams, DEC Papertape software, £500. G4FUN, QTHR. Tel 0705 385589.
Garex Twomobile, fm/a.m., S17, S20, S22, fitted new pa, rx recently updated, £70; TCS10 all mode 2m tx, vfo, toneburst, plus one xtal channel; both vgc. Prefer buyer inspects collects by appointment, or carr extra. G3ADZ, QTHR. Tel Rugby 815222, evenings.
FT101E, as new, used only for 2m transverting, £425. FDK Multi U11 70cm fm tx/rx, 9ch fitted, £225. Trio TR7500, £175. G8LQC, QTHR. Tel Leeds (0532) 675527.
TS515 Trio system, comprising TL-911 2kW linear, VF55 vfo, psu, rf speech processor, Electrovoice mic, cw xtal, spare transistors, valves, manuals, £500. G3PTN, QTHR. Tel Leeds (0532) 654644, evenings.
Collins 75S-3 rx, 32S-3 tx, 516F-2 pwr supply and spkr, Magnum Six speech compressor, large quantity spare valves, comp manuals, 300 countries worked, £400. Buyer collects. Tel Ashtead (Surrey) 72626.
FRG7, mint cond, under 10h use by elderly swl, headphones, in orig packing, handbook, etc, bereavement reason for sale, £130. Write or phone. K. Ruffley, 9 George Avenue, Marton, Blackpool FY4 4JR. Tel 0253 65007.

"SWM", vols 8–14 bound, vols 15–28 comp; *RSGB Bulletin,* vols 25–31 bound, vols 32–43 comp; *Radio Communication,* 1968–1970 comp; no splitting, property late G4XC, buyer collects, offers. G3RGC, QTHR.

"Newnes Radio and Television Servicing", 20 volumes, comp from No1 to 1972 models, vgc, £30. G4BRG, QTHR. Tel 01-529 3803.

Trio R300 comm rx, operating manual; Daiwa CL-22 coupler; both as new, offers over £100. Warwick. Tel Southampton (0703) 847183.

FT2 auto, 144MHz, 8ch, autoscan, 10W output, as new, 10h use, manual, accessories, £100. Tel Ashtead (Surrey) 72626.

2m converter, Microwave Modules Ltd MM144/28LO, 2m in, 28m out, local oscillator output, brand new, unused, bargain, £11, post paid. G3IRW, QTHR (Suffolk). Tel Bacton 781403.

FRG7, fine tune, good cond, £150. TR2200G, four repeater, six simplex channels, case, nicads, charger, £100. Garex 4 4m a.m. tx/rx, 6ch, £25. G4EUL, QTHR. Tel Reading 341753.

Trio TS700 2m multimode tx/rx, in orig packing, £295; carr extra. Collins 455kHz cw mechanical filter, 500Hz wide, £15. 2N3866, £1 pair. G3WZT, QTHR (Sussex). Tel Partridge Green 710565.

"Radio Communication", 1969 to 1976, buyer collect, offers. G3YJJ, QTHR. Tel 0703 894200.

NCX-5 hf trans, 80–10, xtal calib, ac psu, manual, good cond, £160. GEC 411/R synthesized digital rx, 6kHz unbroken to 31MHz, immac cond, £475. Buyers must collect please. G4AXS, QTHR (E Kent). Tel Barham 381.

FT7B, psu, four months old, as new, £425. Versatower P60, TA33 high-power 10-el 2m Yagi, cables, Emoto 103LBX rotator, all good cond, comp, £300, no offers. FT202, hand-held, six months old, charger, nicads, £90. G4GKX (Dorset). Tel 0202 696929.

FT101, covers 160m, fan fitted, mic, good cond, nice rig, £275. G4EBX, QTHR. Tel 0773 812766.

STE ARAC 102 2–10m rx, a.m., fm, ssb, £80 ono. 8Y/2M Yagi, £8. Buyer collects. J. Cheshire, 4 Whitehouse Crescent, Sutton Coldfield, W Midlands. Tel 021-378 0540.

FT10B, 10–160m, fan, mic, instruct manual, spare pa valves, orig plastic skin on front panel, vgc, prefer buyer collect, £320. G3SPU, QTHR. Tel 0225 703696.

Liner 2, no mods, exc cond, £105 ono. D8, 2m, 50Ω, £12. 898; other small items. G8BAD, 23 Malvern Drive, Thornbury, Bristol. Tel 417823.

Heathkit IO–18U 'scope, vgc, £35. TF995A/5 sig gen, £150. QRO antenna relay, psu, £6. Nice 19in cabinet, 22in high, £10. 3cm tx/rx, wkg, £10. 7768 computer system comprising cpu, mon 1, 4k ram, in-comp 4k ram pcb, all ics in sockets, c.u.t.s. interface, fully documented, dozens of programs, £110. Petitevid vdu, keyboard, psu, custom case, £65. Rigonda 6in tv, suit vdu, £35. MM64 multi-mode/band rig, requires completing, £80. WHY? G3WXO, QTHR. Tel 0908 56 4419.

Marconi TF801D/1, TF1370, TF1041B, TF1041A, TF893, decade attenuators 0–9dB, 0–90dB, HP 417A vhf detector, Seimens rf power meter, Advance psu 0–50V at 10A, PG54 pulse generator, Airmec Radivett type 211, Weir dvm, Waverley phase shift generator and twin lpf, Avo 48A, Cambridge ac test set, low band Cossor Commando 20W r/t, EA52 diodes for vvm probes, vhf power amps, incl vswr bridge, vhf driver pcbs, much more, too numerous to mention. Tel West Drayton 43694, evenings and weekends.

TS520, battery pack, leads, as new, £370. Pye Bantam, R4, R6, S23, ac power pack, £30. BC221, ac power pack, £15. Buyers collect. G3NWP, QTHR. Tel Glossop 61046.

FC301 antenna tuner, incorporating power and swr meters, 4-way antenna switch, almost new, perfect, £89. G2KF, QTHR. Tel 072 681 2337.

Black and white reel-to-reel video tape recorder, tv camera, 1:18f 12·5 to 75mm zoom lens, 2½h of high quality tape, £400 ono. Tel Lawrence, Basildon 284601, work; or Great Dunmow 810677, weekends.

Trap vertical HF5 V, 10–80, as new, boxed, £25. Buyer collects or carr extra. Shure 444, new, boxed, £18. G2ACZ, QTHR. Tel 05213 3233, evenings.

Europa 2m transverter, coaxial relay, £60. Datong rf processor, £30. G3NMZ, QTHR. Tel Luton (0582) 591749.

HMV stereo record player, 3-speed, good, wkg, £20 ono. HRO coils, I've got seven bandspread, £10.50 ono. SW adapter for car radio cvrs, 90, 60, 49, 41, 31, 25, 19, 16, 13m bands, exc wkg order, runs off 12V or 6V, negative or positive earth, comp, £4.50 ovno. *Wanted:* not wkg R107, for spares, will exch for the HMV record player; desk for shack, type with three drawers one side only. R. Cuddington. Tel Woburn 545, after 6pm.

Trio 2200GX, 12ch, nicads, charger, heliwhip, boxed, £125. VFO30G, £50. Pye base fm tx/rx, 60W variable power, toneburst, preamp, 12 xtal channels, plus FDK Multi vfo covering 144–146, clean 19in cabinet, £140. Eddystone EA12, mint, £140. G4BLJ, QTHR. Tel Brighton (0273) 503980.

Topmobile 160m rx, £18. Codar AT5, £25. Codar 12V mobile psu, £12. Command rx, 1·5–3·0MHz, £8.50. G3HWX, QTHR. Tel Halsall (0704) 840328.

MOS memories MN5280D, 4k × 1, eight only, £50 ono. RA17L rx, £200 ono. MM28–144 transverter, £65. G8GHO, QTHR. Tel 061-439 3053, after 6.30pm.

Comp vhf/uhf stn, all modes, incl repeater shifts, Oscar, etc, comprising Trio TS700 tx/rx, MM MMT432/144R transverter, £450 ono. G8BFW, QTHR. Tel 021-748 2352.

FDK Multi U11, fitted 10ch, plus RRB2, £210. KW2000E, 160–10m, £280. Buyer collects or pays carr. G8HED, QTHR. Tel 0253 853632.

Heathkit SB303 amateur band rx, handbook, exc cond, £150; or exch Yaesu FL400 or similar. Tel Buxton (Derbys) 2917, any time.

FT101E, orig packing, spare finals, extra mic, YD844, all cables, manual, £475. Codar mobile psu, £10. G3TCJ, QTHR. Tel 0579 42073.

12AVQ 3-band vertical, as new, selling because beam installed, buyer collects as constructed for phone bands, 13ft 6in long, or add £1 postage if dismantled, £25. G3EWP. Tel Newcastle (Staffs) (0782) 619575.

Drake TR7, DR7 digital readout, ssb and cw filters, AUX7 range, service manual, PS7 psu, immac, recently checked by Radioshack, £700. MN7 atu, £65. G5NU, QTHR. Tel Reading (0734) 81200.

Ten-Tec PM2B QRP, AC5 atu, phones/key, etc, £30. G3KPP, (Shrewsbury). Tel Montford Bridge 677, after 6pm.

TS700G, SP70 matching spkr, mint cond, £350. Creed 7B silence cover, £15. DT600 rtty demod/mod, £60. Creed paper-tape auto tx, £15. RTTY distortion analyser, £8. Pye 10W fm 145·30MHz tx, £45. D. Allen, G8LHD, New House, Water Lane, Barnardiston, Haverhill, Suffolk.

Quartz 16, channels available total 25, vfo socket, fitted 18 xtals, repeaters R2–7, simplex S0, S14, S16–25, orig packing, £145. G4IHF. Tel 0706 40877.

Eddystone 880/2 ssb rx, manual, vgc, £200. EA12 rx, manual, vgc, £140. Hallicrafters SX122 rx, £110. FT7 tx/rx, £265. FL110 linear, £100. *Wanted:* Eddystone 990R rx and manual, w.h.y.? G4AFY, QTHR. Tel Kidderminster 63358.

Sommerkamp TS288A (FT101), fitted 160m, £280. W. Stirling, GM4DGT, 8 Ormiston Drive, Alloa FK10 2HB.

FTDX150 hf tx/rx, 80–10m, usb/lsb/cw/a.m., 120W p.e.p., good cond, £160. GW3NSP, QTHR. Tel 0222 753622.

Trio TS510, PS510, 80–10m, 180W p.e.p., £160; or swop for hf linear. Heath HW7 QRP, £40. Heath vfo, 80–10m, psu, £10. G3ZHE, QTHR. Tel Penketh 5735.

77-68 micro consisting of: cpu, monitor 1, vdu, Cottis-Blandford interface, home-built card frame, cards, built and wkg, system still needs wkg on, £100. L. J. Stubbs, G4DBX. Tel 0270 581657.

KP202, 2m, fm, hand-portable, fitted 6ch, case, nicads, charger, helical whip, £85 ono. Buyer collects or carr extra, or could deliver in Reading area. N. Hoult, G4CIK, NOT QTHR. Tel Reading (0734) 864611, office hours.

SF1 Starphone, handy tx/rx, aligned 70cm, needs xtals, £38. Heath HA201 2m pa, 1W in, 10W out, £15. Nelson Jones fm tuner, Portus Heywood stereo decoder, £40. Pair 20W 13 by 8in spkrs, £16. HB Ranger, £5. Tel 06845 63270.

FT227R, absolutely mint cond, hardly used, prefer hf, incl orig packing, all accessories, etc, £190. G4HQN, QTHR. Tel Leicester (0533) 832515, days.

Shack clearance: Heathkit I0-12U oscilloscope, £30; MFJ cw filter, CWF2, £10; h/b Z-match, wide-spaced capacitor, £8; antenna noise bridge, £5; Heathkit 1410 electronic keyer, £30; G3KHZ keyer, iambic paddle, £20; all good cond. G4DUS, QTHR. Tel Rickmansworth 77616.

TM56B 2m rx, mint cond, fitted 12ch, £75. NR56 tunable 2m rx, exc cond, £25. pair Aiwa hi-fi mics, uni-directional, as new, £16. Tel Ashford (Kent) 22506.

FT2FB 144MHz fm tx/rx, fitted eight simplex, three repeater, rev R0, £110 ono. Belcom R115E psu, rated 3A continuous, £15. G8LXY, 126 Putteridge Road, Luton, Beds LU2 8HQ.

Heathkit Cointrack metal detector, nicad cells, charger, prof built, new, model GD1190, £60. Pye, G3KFZ, QTHR. Tel Norwich 57725, any time.

Trio VFO820, new, £95: Trio SP820 spkr, new, £27; both tested, unused, boxed. G3SEF, QTHR (W Midlands). Tel Cheslyn Hay 415369.

Hilomast WTM/1 3-section telescopic mast, 17–43ft, epicyclic geared winch, reversible electric motor, transformer, etc, wall brackets nearly finished, must sell as moved QTH, all vgc, £350 incl delivery. G8IQO, 45 Springfield Close, Westham, Nr Pevensey, E Sussex.

FTDX401B, exc, ptt mic, spare tubes, etc, offers. FRG7000, as new, two microwave modules, £295. *Wanted:* FL2100B; SB200; hf mobile SM220; cash, or exch above items. G4IQT, NOT QTHR. Tel Luton 881323.

KP202, 2m, hand-held, 6ch, helical whip, nicads, charger, £80. Icom IC700R hf rx, £50. Liner 2, £90. GE4DN, QTHR. Tel 01-508 8802, after 6pm.

Drake SSR1, boxed, new, £85. Eddystone 840C, £60. US Army Signal Corps telephone EE-8-A, in leather case, £6. Gates, 3b St Phillips Square, Battersea, London SW8. Tel 01-720 5839.

Trio TR7500, mobile mount, mag mount, £190. 12V 5A metered psu for above, £15. Heathkit OS2 'scope, £15. Heathkit GD1U, £10. 160/80m a.m./cw tx, £15. 160–10m rx, requires aligning on 20/10m, £15. DFM, 8-digit, 25MHz, £15. DFM, 6-digit, 150MHz, needs case and 8–9V dc, £20. Test gear, psus, swrs, xtal std, books, mags, all cheap, sae for lists. G4CIC, QTHR. Tel Rochdale (0706) 77620.

Icom IC240, latest model, £150; Trio TR7010, 144·100, 144·315, £135; both exc cond, no mods, mobile mounts, manuals orig packing. *Wanted:* gdo and dc rx. G8PCD, QTHR. Tel 0783 73531.

Liner 2, fitted PA3 preamp, £95; 12AVQ, 10–15–20m, £25; HF5, 5-band vertical, £25; all in vgc. Buyer collects or pays carr. G4DTO, QTHR. Tel 0977 554 792.

Trio R820 rx, £600; Datong UC/1, £80; Pet 2001 8k computer, £450; M65 rtty/cw program for Pet, £45; all items less than six months old. McAllister, 218 Eckington Road, Coal Aston, Derby. Tel Sheffield 692604, days; or Dronfield 413413, evenings/weekends.

AR240 hand-held tx/rx, 144–148MHz, in 5kHz steps, £140. YM24 external mic/spkr for FT202, £5. Carr extra on both items. G8SVS. Tel Les, Dewsbury (0924) 452303.

Drake T4X, AC3 psu, £290. Drake 2A rx, Heath Q-mult, £75. Dentron 1kW antenna tuner, £55. Shure 444, £25. Drake TV1000LP filter, £10. G5BUX. Tel Caterham 43461.

HW100 tx/rx, HP23A psu, SB600 spkr, handbooks, £180. Yaesu FT7 tx/rx, FP4 psu, little used, handbook, orig packings, £275. BC221, charts, metal case, £20. G3KGW, QTHR. Tel Codsall 2214.

Mint Trio TS520, £420. Mint Yaesu FLDX500, £190. G3NJC, QTHR. Tel Doncaster (0302) 49237.

Superb TS120V, boxed, £350. Unmarked FT101, FTV250, producing 1·8 through 28 and 144MHz, £500. G8CK, QTHR. Tel 03843 4360.

FT101E, little used, 15 months old, £475 ono. Matching Europa B transverter, 2m spare pa valve, £80 ono. D. Mallet, G4HIF. Tel Maidenhead (0628) 21631, evening; or Slough 34534, days.

Trio TS700G 2m multimode tx/rx, mint cond, orig packing, simplex and two repeater xtals fitted, £350. FT2F 2m fm mobile tx/rx, 1/10W output, 12ch fitted, extra xtals, £80. G8MLT, QTHR. Tel Worthing 67452.

R216 rx, 19–157MHz continuous cov, a.m., fm, cw, mode selection, built-in xtal calibrator, matching psu, well cared for, £120 ono. G3RHZ, QTHR. Tel Sapcote (045527) 2880, after 5pm.

Storno Viscount, fm, l/b mobile, 12V, tx/rx unit only, untested, £9. Q-multiplier, Codar, mains powered, 450/470kHz, peak, null, for increased selectivity, will work into KW2000, £10. *Wanted:* valve 6L7. G3MBL, QTHR (N London). Tel 01-445 4321.

HF stn, late G3WKA: Vespa Mk2 tx with psu; HQ170A rx; E-Zee match; swr meter; class D wavemeter; Heathkit RF1U sig gen; £220 ono; or would sell separately. Tel Letchworth (04626) 71925.

Versatower SP60, Autobrake Loughing, electric hoist winches, spare cables, AR22 rotator, TA33Jr, 2Q6, cables, coaxial, £550. G3MTX, QTHR.

Kit for pair of Celestion spkrs, comprises 12in bass units, cross-overs, tweeters, 50W capability, bargain at £50. SEI ssb filters, usb/lsb, plus 1·6MHz xtal, offers. VCR97, £5. 22in Philips colour crt, almost new, offers. Phone for details. Tel Stocksfield 3449.

Nascom One microcomputer, power supply, B bug, tiny basic, other software, £130 ono. RCX panoramix radio adapter, input 450–475kHz, sweep width ±100kHz, £40 ono. G3TRV, QTHR. Tel Wakefield 79163.

TS700, £270. Siemens power meter, 0–5GHz 25W, 0–12GHz 500mW, £35. Marconi Instruments TF91D deviation meter, 1GHz, £35. Elliott tape reader, 8-hole, 500cps, £35. 'Scope, Heathkit, 5in, 5MHz, £35. 5in 'scope tube, hardware, £5. 5-hole tape, 13 reels, £3. Slemp. Tel Chelmsford 66776.

FTDX560, in good cond, some valves renewed incl pa, some spare valves, £250 ono. Carr extra. GW2DPD, QTHR. Tel 0222 701267.

Trio-Kenwood TS820S, cw filter, absolutely mint, orig boxes, £675. New matched pair 6146Bs, £8 TS820(S) workshop manual, £7. G3SEF, QTHR (W Midlands). Tel Cheslyn Hay 415369.

FM 2m hand-held tx/rx, homebrew, 6ch, R3–5 fitted, nicads, helical whip, internal mic, £60 ono; or exch for hf bands rx. G8TGM. Tel Bognor Regis 20095.

Sommerkamp FTDX500 (Yaesu FTDX400), 560W p.e.p., 10–160m, two spare bands, good cond, maker's carton, instruction manual, £220 ono. Prefer buyer inspects and collects. G5BM, QTHR. Tel Newent 820960.

IC245E, good cond, £310 ono. G8PFC, QTHR. Tel 09562 542.

Pye Cambridge AM10DS, Cossor fm base stn, Vanguard, a.m., psu, Stolle Memomatic rotator. P. Edwards, 49 Byfield Road, Woodford Halse, Daventry. Tel Byfield 60774.

IC22A, 17ch, all repeaters, 10 simplex, xtal t/burst, comp, in new cond, packing, £130. Heathkit HM2102 vhf power meter, £20. G4AQZ, QTHR. Tel 0255 84 632.

Heathkit model IO-4560 5MHz oscilloscope, construction manual, unused, time base fault, 10-el X-Yagi, slight damage, £15. 88-el multibeam, £25. Buyers collect. Tel 021-552 2853, evenings.

G2RO, now re-equipped, offers his comp Heathkit stn with all manuals: SB200 linear, SB300 rx, SB400 tx, SB600 spkr, SB615 monitorscope, £450; or units perhaps separately negotiable. Collect. Ask for details sheet. G2RO, QTHR. Tel Kingsbridge (Devon) 580616.

Deceased amateur's HW7, QRP, £30, or offers. 10-el 2m Parabeam, unused, boxed, £20. Pye Pocketfone PF1, SU8, batteries, manual, homebrew charger, £20. Vanguard, fmd, xtalled, 6ch, automatic toneburst, manual, £30. SSM Z-match, £25. G4IEY, QTHR. Tel Cheltenham 36715.

FT221R, /D, 600/1·6 shifts, £320. UHF portable Starphone, fitted RB4, t/b incl leather case, nicad, charger, spare battery cases, SU8 xtals, £60. G8CJL, QTHR. Tel Ipswich (0473) 213939.

Heathkit stn, SB301, a.m. and cw filters, £120; SB401, extra xtals, new spare valves incl 6146s, £170; both just overhauled by Heath at cost of £70. SB200 linear, £260. Comp stn, £500. 2m 40ch synthesized tx/rx, as *Wireless World* Nov/Dec 1977, nearly comp, pcbs incl £80 worth of components, £40. *Radio Communication* in binders, 1962–79: recent, £6 ea; old, £4. Advance sig gen, £10. KW low pass filter, £10. KW 1kW dummy load, £12. Racal dfm, £15. Chart recorder, £5. Coaxial switch, 5-way, £7. *Radio Communication Handbook,* both volumes, £15. 30 books on electronics and radio, £7. Dawe true rms valve voltmeter, £5. Dawe audio oscillator, £10. Avo electronic Avometer, £10. Marconi TF501 sig gen, £5. Heath monitorscope, needs attention, £15. Rotator, CDE old but still works with 70ft cable, £25. Buyers collect or carr extra, all items. G3KWK. Tel Redditch 41502.

FDK700E, 25W, 25 or 50kHz spacing, vgc, £180. Reason for sale—bought multimode. Thurlow, 6 Bosworth Road, Dagenham, Essex. Tel Peter, 01-592 4786.

TS700S, as new, 4CX250B h/b 1in, 8-el Yagi rig unmarked, linear self-contained with mains psu and coaxial relays, uses a vhf Airflow base and Eimac valve, £500. WIll not split. GW4BXE, QTHR. Tel 06333 65010.

Racal RA17L, mint, in cabinet, recently overhauled commercially, offers around £250; or w.h.y.? Creed 7B Mk10, 6S6M auto, offers. Buyers collect both. G4FUA, NOT QTHR. Tel 0780 56129, evenings.

WANTED

Unfurnished QTH, within 10 miles radius of Bath, for about three years, living room, kitchen, bathroom, two bedrooms or better, plus room for stn, don't mind sharing farmhouse, cottage, etc, one grown up son. GM4HXW. Tel 050 55 2141.

To borrow, circuit diagrams of Geloso tx G4/228, and power pack G4/229. G4AFW, QTHR. Tel Aldeburgh 2464.

HRO dial and drive, in perfect cond, or other geared reduction drives and dials of quality, Jackson, Eddystone, etc. Variable capacitors for atu. H. de Laistre, Place de la Mairie, 41600 Chaon, France. Tel (54) 08 10 45.

Urgent: service data, circuit diagram, or any information on the Russian "Rigonda M" portable television, or Russian to English transistor lists, will refund all costs. R. C. Adams, G8RWJ, Kirojuke, Pett Road, Pett, E Sussex TN35 4ME. Tel 0424 86 2012.

High/mid band tx/rx, eg Pye Bantam or Westminister. GM4AOR, 27 Forest Side, Worcester Park, Surrey. Tel 01-337 2597.

Handbooks and circuits on: Sommerkamp FL1000 linear; Heathkit gdo GD-1U; and Eddystone 960 rx; purchase or photocopy and return, all postal expenses paid. Lewis, G3XHM, QTHR. Tel Ryde 66607.

Xtals: 6,978kHz, 9,00kHz, 1,994kHz, 15,940kHz, 23,000kHz. G4EOD, QTHR.

Reflex horn loudspkr, handlebar mounting, as used with motorcycle Westminister, etc. G8JQK, 2 Woolven Close, Poole, Dorset BH14 0QT. Tel 0202 730330.

Circuits, w.h.y. for PCR No 3 Mk1/Z? To buy or borrow (returned promptly). *For sale:* Hewlett Packard 120B oscilloscope, 450kHz bandwidth, superb cond, £60 (will haggle). A. Lewis, 95 High Street, Offord Darcy, Huntingdon, Cambs. Tel Alec, 0480 811169.

NAG linear, model 2200 or similar. 200W+ mobile linear, 13·8V wkg, must be mint. G8SZD. Tel Ken 0632 678828.

Loan of circuit or handbook for Drake 2B rx, quick return with expenses. G3WWF, QTHR. Tel Leeds 825519.

ATU, KW109, FC901, or similar type. G3VQL, QTHR. Tel Nesscliffe (Salop) 230.

Creed teleprinter. G8RCS, QTHR. Tel Wigan 214036.

Sanders Associates display terminal, type 622, loan of circuit diagram/handbook, or photocopy purchased. G8KNJ. Tel Mogador 3261.

Rent furnished house, flat, for three months leave by 7Q7BC/G3UFI and family, prefer N Somerset/Bristol area but open to offers, any period May–November 1980, operation hopefully anticipated as 7Q7 QRT since 1976! Conway, Box 5595, Limbe, Malawi.

Creed 7B/RP teleprinter, any cond, Creed 7TR reperforator. G3TAZ, QTHR. Tel Luton 26995.
Yaesu FT221 multimode or similar, for vhf; phone with details. *For sale:* two FP7A long persistance orange crts for sstv, brand new. G3RQY. Tel Norwich (0603) 42967, evenings.
Osker power/swr meter. Geloso/Minimitter converter. Mk5 Decca navigator rx, or handbook Omega TE7-02. Circuit or info on TW communicator, 2m. Minimitter 2–7 mobile tx. Redifon GR286. GW8TSP. Tel Neath (0639) 820356.
EC10 Mk2, mint cond. HF tx/rx, or separates, KW, Yaesu, etc. GW3YTL, QTHR. Tel Knighton Powys (0547) 528030, 6–8pm.
Eddystone 990R rx and manual; exch model 880/2 hf ssb rx, vgc. G4AFY, QTHR. Tel Kidderminster 63358.
"Radio Communication", January 1975 and November 1978. H. J. Timm, DL7GP, Bouchéstr 64, 1000 Berlin 44, Germany.
QVO8-100B, elderly homebrew, boots need a resole, new or used leather acceptable, 19V or 6·3V heater versions will do. GW3JBH, QTHR.
Trio VFO30G. Tel 0904 27123.
TU5B tuning unit, or similar. G4BQJ, QTHR. Tel Warrington (0925) 35330.
Rack mounting HRO, CR150 or similar, can exch HRO in cabinet, have own coils, fair cond, cash adjustment. Info on Chore Horse petrol engine 12V charger. GW3GHC, QTHR. Tel 0633 680481.
Hilomast PNAM 1; Shure 444 mic; Trio 9R59D rx; all in good wkg order please. G4HAF, QTHR (Codsall, Wolverhampton). Tel 09074 3509.
Ten Tec Argonaut, two needed, good price paid, can collect Essex, Kent, London. Heavy key, eg RAF 7373 or similar; I have two Junker keys and would be interested in a swop. G3UTT, QTHR (Maidstone, Kent). Tel 0622 39936.
Young, new swl requires amateur bands rx, eg 9R59D, cash available up to £80. c/o G4DQS, QTHR. Tel Brighton 37992.
Location of firm, or circuit diagram, Dartronic 'scope, model 415, your price and expenses paid. G3OXV, QTHR. Tel Daventry 2265.
SSB hf tx/rx, KW2000 or similar, separates considered. BC312/342 rx. *For sale:* IC202, 25W, linear, 5-el Yagi, mobile ⅝ whip, magnetic mount, £160; or exch. G4IXY (G8SSQ). Tel Garston (Herts) 70115.
G2DAF rx, preferably Mk2, must be prime example, reasonable price please. Bowden, G4BAB, Hollyside, Holmwood Drive, Kirby Muxloe, Leicester. Tel 0533 393842.

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2N5913	2	7	12	470	**£1.40**
SD1127	4	12	12	175	**£2.00** (1)
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SD1143	12	10	12	220	**£5.70**
2N6081	15	6·3	12	175	**£5.50**
2N6082	25	5·7	12	175	**£7.50**
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SD1019-5	100	6+	28	175	**£18.00**
2N5590	10	5·2	13	175	**£4.70**
2N5591	25	4·4	13	175	**£6.80**
SD1428	45	6·5	12	175	**£12.45** (2)
2N5944	2	9	12	470	**£5.40**
2N5945	4	8	12	470	**£7.50**
SD1135	5	7·5	12	470	**£5.25**
SD1136	10	5·5	12	470	**£6.40**
2N5946	10	6	12	470	**£9.50**
SD1088	25	6·8	12	470	**£16.45** (2)
SD1089	40	4·3	12	470	**£19.50** (2)
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NOTE (1) G.Emit. IC202/215 P.A. (2) Controlled "Q" Type

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The video display unit is designed to be an all-electronic replacement for a Teleprinter, and therefore does not suffer its disadvantages—bulk, unreliability and noise.

The basic function is to take Murray Code—either from a Terminal Unit (on receive) or from a Keyboard—and produce a complete TV signal. This signal may be fed into a monitor or modulated and fed into the aerial of an ordinary domestic TV set. The resulting display is a page of 16 lines of up to 64 characters.

It may also be used (with its keyboard) to send fully encoded Murray Code signals for transmit purposes.

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Standard IV video output
Flashing cursor
Auto-scroll at end of page
Cabinet size 9" × 2½" × 7" approx

Front panel controls for: Letter shift
Figure shift
Page reset
Carriage return
Line feed

Built-in mains PSU
Styled to match the Catronics CT100 Terminal Unit

Model CD300 VDU as above: £160.00
Model CD310 with built-in UHF modulator: £170.00
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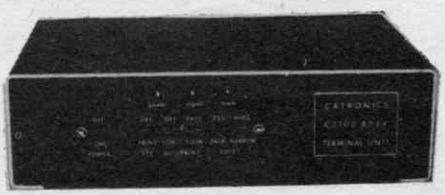

Inputs for:
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Data in from VDU (eg G3PLX).
TTY Keyboard or Tape Reader

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Featuring a unique digitally controlled **'Autoprint'** circuit which is a superior replacement for the 'Antispace' and 'Autostart' facilities found on some other terminal units. The terminal will ignore most CW and phone signals but will respond to a correct RTTY signal.

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G3PLX RTTY VIDEO DISPLAY

(April 1977 Rad Com)
Kit (excluding modulator and keyboard) **£90.45**
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UHF Modulator kit **£13.25**
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Diode Matrix kit **£16.35**

Please add 30p postage.

NOTE regarding PROM program: The PCBs and programmed PROMs supplied by us make use of a slightly different program sequence resulting in different pin connections to those published in the 'Rad Com' article. Whilst constructors buying PROMs and PCBs from us will have no difficulty, those producing their own PCBs or having PROMs programmed elsewhere should note this important difference. A detailed modification sheet is available with the PCBs.

KEYBOARD KIT

The printed circuit board is designed to take a maximum of 70 keys but may be assembled with a smaller number of keys for a simpler keyboard.

The board is not dedicated to any specific coding, allowing it to be used for any project whether it requires ASC11, Baudot or any other code. This makes it suitable for many projects including;

G3PLX RTTY VDU
Auto morse sender, etc.

The Keyswitches themselves are single pole push-to-make type and require no extra mechanical mounting arrangements.

A legend sheet is provided with each kit enabling the constructor to label the keys to suit individual requirements.

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ICOM

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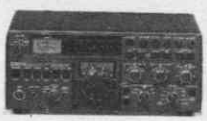
TS-120S £495
TS-120V £408

When Trio decided to drop the TS520S, there was such an outcry due to the tremendous popularity of this great rig that they re-introduced it as the TS520SE—E for economy. All the best features remain, and a facility has been added to switch in an optional narrow CW filter. For sheer value for money for a home station rig, your choice has to be the TS520SE from Trio.

TS-520SE £485

If you are looking for a 2M mobile rig with rather more than just the basic features found on most sets, then look no further. The TR7600 gives you 10 watts of crisp clean FM (25 watts from the TR7625) plus the ability to plug in the remote control microprocessor key pad unit—The RM76.

TR-7625 £273
TR-7600 £247



The TS180S is the most up to date state-of-the-art rig that is available today. It makes extensive use of space age technology to give the operator on our crowded HF bands the most powerful tools available to aid effective communication.

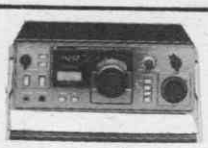
TS-180S £826

The TR2300 is the only rig that gives you the best of both worlds for 2M FM operation. Load it with nicad batteries, put it in the carrying case, and you have a go-anywhere portable rig to keep on your shoulder wherever you go. Drop it into the optional mobile bracket, plug in the car antenna and a 12V supply, and it becomes a sophisticated mobile rig..

TR-2300 £199

Don't let the price tag on this superb rig put you off. Just take the price of any good quality multi mode 2M transceiver and add to it the price of a 2M to 70cms transverter. This will give you a more realistic base for comparison.
So if you want 70cms and 2M capability, or think you may want it in the future, come and try out the TS770.

TS-770 £775



It is some time since a brand new design has appeared in the amateur general coverage receiver field, and the new R1000 certainly makes the wait worth while. Suffice to say that we try lots of different receivers, and the R1000 performs better all round than every other in its price range. Convince yourself as we are convinced—come and try one and compare it side by side with its competitors.

R-1000 £299

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ASP noise cancelling (hand) 600Ω	£6.75
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MMC 144/28	£21.85
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MMC 432/144S	£29.90

TRANSVERTERS

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SWR METER (twin) SWR25	£13.00
SWR METER T435 (432MHz)	£34.40
SWR METER SW110 (150 MHz)	£35.00
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TRIO RM76 Keypad	£76.00
ICOM IC255E	£255.00

2 METRE FM HANDHELD

FDK Palm II	£99.00
YAESU FT202R	£119.00
FDK Palmsizer	£149.00
A,O,R, AR240	£165.00
YAESU FT207R	£199.00
TRIO TR2300	£199.00
TRIO TR2400	£235.00

2 METRE MULTIMODES

ICOM IC260E	£369.00
ICOM IC211E	£549.00
YAESU FT225RD	£575.00
TRIO TS770 (+70cm)	£775.00

2 METRE SSB

MIZUHO SB2M	£165.00
ICOM IC202S	£199.00

2 METRE FM RECEIVERS

SEARCH 9	£59.00
FDK TM56B	£106.00

MARINE VHF RECEIVERS

SEARCH 9	£59.00
SR11	£87.00
FDK TM56B	£115.00

70cm EQUIPMENT

FDK PALM IV	£159.00
STANDARD C7800	£275.00
TRIO 770 (2M+70cm)	£775.00

ROTATORS (carr. £2.50)

TRI (TV+FM)	£31.00
STOLLE 2050 (LIGHT VHF)	£42.50
AR30 (LIGHT VHF)	£47.15
9502 Colorotor (MED VHF)	£51.15
AR40 (LARGE VHF)	£54.75
KR400 (MED VHF)	£105.00
CD44 (MED HF)	£109.25
HAM IV (LARGE HF)	£166.75

SPECIAL OFFER (carr. 75p)

POWER SUPPLY 12V 3A CONT	£18.80
POWER SUPPLY 12V 750MA CONT	£11.20

TO ORDER ANY OF THE ABOVE ITEMS SIMPLY WRITE ENCLOSING A CHEQUE OR PHONE YOUR CREDIT CARD NUMBER TO BREDHURST ELECTRONICS THE HIGH ST HANDCROSS W. SUSSEX 0444 400786

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HOW TO REACH US (EASY PRIVATE PARKING ON OUR 70ft. FORECOURT)

FROM SOUTH AND EAST. We are located approximately two miles from Junction 5 of the M6 from which follow signposts to Birmingham. Within ¼ mile turn right at Clock Garage and proceed towards city. After one mile look for traffic lights at Fox & Goose and immediately over the lights take minor left fork into Alum Rock Road. We are located one mile from this point.

FROM NORTH. Leave M6 at Junction 6 (Spaghetti) and follow left fork down to traffic island beneath motorway complex. Take third turning off to Lichfield. One mile further on follow A4040 to the right and within 100 yds. veer again to the right, approximately one mile further on brings you to the Fox & Goose. Turn right and see preceding directions.

FROM THE WEST AND SOUTH/WEST. Follow M5 then M6 to Spaghetti Junction (see above). Alternatively, leave M5 at junction 4 or 3 and proceed to inner ring road. Turn South on ring road and leave on A47 (East). We are located three miles from this point.

Hours: 9.30–5.30 Continuous including Saturdays—Early closing Wednesday, 1 p.m.

AMATEUR ELECTRONICS UK

source for YAESU MUSEN

H

THIS MONTH WE SHOW JUST A PORTION OF YAESU'S EVER-GROWING RANGE ALTHOUGH INCLUDED IS THE EXCITING NEW FT-207R MICROPROCESSOR CONTROLLED 2 METRE HAND HELD. TIME DID NOT PERMIT US TO FEATURE THE NEW ALL SOLID STATE FT-107M HF TRANSCEIVER AS DISPLAYED AT LEICESTER BUT BY THE TIME THIS APPEARS IN PRINT OUR FIRST DELIVERIES SHOULD BE THROUGH. (PLEASE SEE BELOW REGARDING FULL LITERATURE.)

G

A FT-202R ultra-compact 2m FM hand-held. Weighs less than a pound, comes in like a ton of bricks!

B FT-901DM Competition Grade all-band HF Transceiver—strictly for that class of operator who will insist on the best and *only* the best!

C What would the aspiring SWL do without the sturdy FRG-7? Used in thousands throughout the world and giving better performance than many a more expensive set.

D FT-227R Memorizer 2m mobile. Sophisticated electronics coupled with the usual Yaesu high quality construction makes this the best scanning rig on the market.

E FT-225RD 2m all-mode base station. Whatever the options you'll never find a finer VHF rig and its new low price makes it the best buy on the market.

F Dedicated SWL's PLEASE NOTE. When you invest in that receiver to end all receivers don't cut corners on cost and regret it at your leisure. With the famous FRG-7000 General Coverage Receiver you find the very best in electronics together with superb mechanical construction in a *non-miniature* set that does justice to your station and yet is lightweight enough for complete portability.

G Here's the brand-new FT-207R which is selling like wildfire simply because it's the best synthesized 2m hand-held on the market. Anyway what else would you expect from something with the YAESU label on it?

H What can be said about the superb FT-101ZD HF Transceiver? Apart from the fact that it is really excellent value for money there are features which leave many other makers products standing. Don't take our word for it, however, just listen on the bands!

THE ABOVE IS ONLY PART OF THE YAESU STORY—FOR FULL DETAILS OF ALL THE MODELS 36p IN STAMPS WILL BRING YOU THE LATEST GLOSSY CATALOGUE OF THE FULL PRODUCT RANGE TOGETHER WITH OUR CREDIT VOUCHER FOR £3.60—A 10-1 WINNING OFFER!

AND WHAT ELSE IS AT AMATEUR ELECTRONICS?

The short answer is 'PLENTY' but the full reply is a very lengthy one indeed these days. Quite apart from the host of accessories and ancillary units stocked we import the superb SWAN range as per our recent advertisements and carry ATLAS equipment and latterly the full ICOM range. Add to these the superb new STANDARD RADIO models and you'll soon see that a visit could be well worth while. If you can't make it of course then we shall be pleased to send you all the information you require by return of post. Have a very happy New Year!

BRANCH: AMATEUR ELECTRONICS, UK—COASTAL, CLIFTONVILLE, KENT, KEN McINNES, G3FTE, THANET (0843) 291297. 9 a.m.-10.30 p.m.

BRANCH: AMATEUR ELECTRONICS UK–SCOTLAND, 287 MAIN STREET, WISHAW, LANARKSHIRE, GORDON McCALLUM, GM3UCI. TELEPHONE WISHAW 71382. (EVENINGS CARLUKE 70914)

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AMATEUR RADIO

ALL UNDER

FT-207R

TR-2400

Here is the only shop in London where *all* the leading makes of Amateur Radio Equipment can be seen and tried under the same roof. In our three years here we have become one of the UK's leading retailers of YAESU and ICOM. Now we are pleased to announce that we have secured regular supplies of TRIO (including all the back-up facilities of spares and servicing that may be needed) so that amateurs in London can have a *competitive* source of supply for this leading brand. Finally, we are marking STANDARD'S come-back to the UK market by stocking their two superb new mobile transceivers of advanced specification and performance.

FT-207R— Yaesu's latest hand-held—microprocessor-controlled, synthesized, with four memories, 2·5W output, LED frequency display, etc.

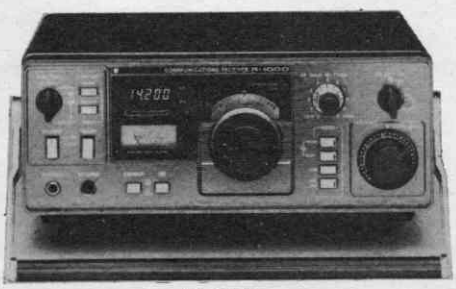
TR-2400— Trio's answer to the FT-207R, with ten memories, LCD read-out etc. Each has so much to offer. Try them both and see which is right for you.

FT-901DM— Yaesu's top-of-the-range transceiver covering top band to 10, plus a full range of ancillary equipment to build *your* station exactly as *you* want it . . . or try the Trio equivalent in the 820 range.

FT-901DM

ALSO IN STOCK

TRIO'S new TS-180S all solid-state HF transceiver with wide-band tuning . . . and YAESU's answer, namely the 107 range . . . and, of course, the well-established ICOM IC-701.



R-1000

R-1000— This TRIO receiver is a new and exciting piece of equipment offering excellent specifications and exceptional facilities to the discerning amateur and shortwave listener. We have been able to secure large shipments of this receiver and, in consequence, are able to offer this at **£289** inc VAT.

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ONE ROOF

THE ICOM TWINS . . .

Following the success of the ever-popular IC-240 here is the latest ICOM 2m synthesized mobile transceiver, the sophisticated IC-255E with 25W output, five memories, two VFO's, scanner, normal and reverse repeater. Also available its twin, the IC-260E with additional SSB facility.

IC-255E

. . . THE STANDARD TWINS

Two new high-performance mobiles from STANDARD, the C-7800 and C-8800. The C-7800 is the first sensibly priced 70cm FM mobile to give full 10MHz coverage in 25kc steps with MHz step-button to cut tuning time. Among other features are tuning from mic or front panel—Su20 available on push-button—two repeater offsets at 1·6MHz and 4·6MHz—digital readout—five memories—two-speed scan. The C-8800 is the matching unit with the same features covering the 2m band in 5kc or 25kc steps.

C-8800

Whether you're looking for a major item of equipment or just some accessories . . . new or secondhand . . . whether you're buying, selling or just browsing . . . Brenda and Bernie invite you to phone or call in to discuss that new rig you've been promising yourself. Try it out in the shop . . . compare it with the others in its class, because that way you'll know that what you're investing in really is right for you. So, come to the shop where they care . . . and have a cup of Brenda's coffee too!

2 NORTHFIELD ROAD, EALING, LONDON W13 9SY. Tel: 01-579 5311

So easy for Overseas Visitors—Northfields Station is just seven stops from Heathrow on the Piccadilly Line—or phone your order and let us deliver it to you at the Airport.

IT PAYS TO READ THE SMALL PRINT

That's why we've chosen it to present our new deal knowing you'll read it and hoping our competitors won't. If you're in the market for a new rig and planning to see your bank manager—DON'T! Ring us first, we'll offer you a H.P. deal to save you a bomb!

For example—looking for an FT 101ZD? You may need to borrow around £670, your bank manager will be looking for repayment over 12 months of around £742, £72 on top, fair enough but expensive enough!

Try Mr Average Dealer, he'll ask you for a deposit of around £134 and the Average Finance Company Limited will require 12 monthly payments of £52.48, you'll pay a total of £763 and be charged around £93 for the privilege.

Here's where reading the small print pays off—on the FT 101ZD we'll ask you for a deposit—a little more than Mr Average Dealer—to be precise, £200, followed by 12 monthly payments of £39.17!... Go on work it out for yourself—didn't we say it?

IT PAYS TO READ THE SMALL PRINT

O.K! So you don't want an FT 101ZD—maybe you've already got one and are looking for an FT 227, FT 225 or even Yaesu's latest cracker the FT 207R—look at the rest of our small print, we've listed 10 star deals for you—as we said

IT PAYS TO READ THE SMALL PRINT

Yaesu FT 901DM		**Yaesu FT 101ZD**		**Yaesu FT 225RD**		**Yaesu FT 7B**		**Yaesu FT 101Z**	
Cash Price	£920.08	Cash Price	£670.04	Cash Price	£557.36	Cash Price	£432.88	Cash Price	£575.96
Deposit	£325.00	Deposit	£200.00	Deposit	£200.00	Deposit	£145.00	Deposit	£200.00
12 monthly repayments of	£49.59	12 monthly repayments of	£39.17	12 monthly repayments of	£29.78	12 monthly repayments of	£23.99	12 monthly repayments of	£31.33
Yaesu FT 227RB		**Yaesu FRG 7000**		**Yaesu CPU 2500RK**		**Yaesu FRG 7**		**Yaesu FT 207R**	
Cash Price	£268.04	Cash Price	£377.00	Cash Price	£356.00	Cash Price	£216.00	Cash Price	£199.48
Deposit	£80.00	Deposit	£142.00	Deposit	£122.00	Deposit	£75.00	Deposit	£82.00
12 monthly repayments of	£15.67	12 monthly repayments of	£19.58	12 monthly repayments of	£19.58	12 monthly repayments of	£11.75	12 monthly repayments of	£9.79

Above offers subject to status report & MLR

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Optimum Performance with KW Ancillaries

DECCA-KW107 SUPERMATCH
Antenna Tuning System Incorporates E-ZEE Match, SWR/RF power meter; Dummy Load: Antenna switch.

DECCA-KW109 SUPERMATCH
A High power version of the KW107 is available

DECCA-KW- ANTENNA SWITCH
Selects up to 3 Antennas. Low-insertion loss up to 200 MHz 1 Kw p.e.p. rating.

DECCA-KW E-ZEE MATCH
Antenna Tuner 10-80 metres, matches 50/75 ohm input to co-ax fed antenna's, also twin feeder and single wire systems.

Other KW Favourites—Decca KW Dummy Load. KW Traps (original and the best) KW Trap Dipoles; Stockist for HY-Gain beams and Verticals: CDR Rotators; Shure Microphones etc. Write or phone for catalogue.

KW

DECCA-KW Balun MK 11.
The Decca-KW Balun is broadband-3 to 30 MHz, rated up to 2 KW p.e.p. 1:1 Ratio 50 ohms 'unbalanced' feed to 'balanced' output. Waterproof moulded case. Suitable for Dipole and Beam Antenna.

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TRIO TS-120V

Full TRIO Range available from stock, including all accessories. Backed by the Trio organisation, we have never felt so confident in offering this range of equipment to the operator who wants the best.

TRIO TR-7600

TRIO PRICES

TS820S	£832.00	TS120V	£408.00	R-1000	£298.00	TR2300	£199.00
TS520SE	£485.00	R820	£790.00	TR7600	£247.25	TR3200	£140.00
TS180S	£825.00	TL922	£797.00	TR7625	£274.00	DM800	£59.80
TS120S	£495.00	TS700S	£549.00	TR2400	T.B.A.		

YAESU

FRG7 Receiver	£214.00
FRG7000 Receiver	£375.00

DRAKE

TR7 Transceiver and AC PSU	£1,022.00
MN7 Antenna Matching Unit	£127.50

Other Drake equipment available to order.

S.T.E. MILAN

AA1 Audio Module	£4.95
AD4 FM Discriminator	£5.00
AT23 C.C. FM Transmitter	£50.00
AR20 C.C. FM Receiver	£50.00
AG10 Tone Burst unit	£4.50

ARAC102. 28-30MHz and 144-146MHz FM-SSB-CW Receiver £107.50

STABILISED POWER SUPPLIES

Model 122 12·6V 2·5A	£15.66
Model 122s 10-15V 2A Single Meter	£22.50
Model 125 10-15V 5A	£28.00
Model 153S 4-20V 3A Dual Meter	£31.00
Model 156S 4-15V 6A Twin Meter	£40.00
Model 1210S 4-20V 10A Twin Meter	£88.00
Model 1220 13·5V 20A	£95.00

Maximum ratings quoted.

MICROWAVE MODULES

MMC144/28Lo 2m Converter	£23.00
MMC432/28S 70cm Converter	£30.56
MMC432/144S 70cm Converter	£30.56
MMC1296/28 23cm Converter	£32.20
MMC1296/144 23cm Converter	£32.20
MMV1296 23cm Tripler	£34.50
MMDO50/500 500 MHz Converter	£73.47
MM F432/28S 70cm Transverter	£136.85
MMT432/144R 70cm Transverter	£173.65
MMT144/28 2m Transverter	£90.85
MMA144 2m Preamp	£14.95
MML144/100 2m Linear Amplifier	£142.60
MML144/25 2m Linear Amplifier	£44.97

TRANSCEIVERS AND RECEIVERS

SRX30 Solid State Receiver	£189.00
Sky Ace aircraft band hand held receiver	£49.00
Swan 100MX Transceiver & AC PSU	£600.00
R512 Aircraft Band Scanning Receiver	£138.00
Digital Flight Scan Airband Receiver	£230.00
SR9 2m FM Receiver	£46.00
FDK TM56B FM Scanning Receiver	£109.00
AMR217B 2m Scanning Receiver	£120.75
FDK M700E FM Transceiver	£195.00
Standard C8800 FM Transceiver	£252.00
220FB Scanning Receiver	£251.50

HY-GAIN

12AVQ 10-15-20m Vertical Antenna	£43.13
14VQ/WB 10-15-20-40m Vertical	£60.38
18AVT5WB 10-15-20-40-80m Vertical	£87.40

VARIOUS ANTENNA

HF5 vertical 10-through 80m	£41.40
Discone 5 Antenna 50-480MHz	£36.80
C4X 10-15-20m Vertical	£43.00
HQ-1 Minibeam Tribander	£96.76

Complete range of JAYBEAM HF AND VHF-UHF Antennas, send 15p for catalogue and price list.

TECHNICAL ASSOCIATES

MULTIFILTER New receiver filtering system. The complete answer to interference and bandwidth problems. Unit contains a peak notch filter and band pass filter £51.80

SWL Preselector	£27.25
Crystal Calibrator	£23.00

G-WHIP. Mobile Antenna Range

Tribander Helical 10-15-20m	£23.00
LF Coils for above	£6.56
LF Telescopic for coils	£3.00
Standard Basemount	£4.20
MultiMobile 10-15-20m	£26.45
Coils for above	£6.56
Extendarod	£10.93
Flexiwhip 10m	£16.00
Coils for above	£6.56

SWL TUNING UNITS

MK2 Covers 550kHz to 30MHz £27.50

Designed and manufactured by us. Fifty switchable tunable positions, will match any antenna to your receiver. Now in use in over 50 countries. Ideal for use with QRP transmitters. Price includes VAT and postage on this unit.

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Due to the fact that our secondhand equipment stock changes daily and our adverts are in press weeks before publication we are not publishing a list. A S.A.E. will bring you an up-to-date list or please phone. Good clean equipment wanted and spot cash will be paid. All secondhand equipment carries a three-month guarantee.

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SUPER RESULTS – EVEN FROM A BASEMENT!
(From a users report)

*** Only 7'6" long * 3 easily assembled sections * 0.5 – 30 MHz., no gaps * Matching Antenna Tuner * No harmonic resonances, highest efficiency power transfer from TX to ether. This ensures TVI and other spurious emissions are just not substantially present * Low angle radiation, operates as a ground plane on all bands, less skips, greater power deployment! * Gives your RX extra front end selectivity, reduces cross-mod and out of band blocking * Tailor your installation to space available. Install VFA on mast or chimney or in roof space with long or short feeder – OR SIMPLY STAND IN THE SHACK * W0KFF used it in BASEMENT, excellent results (Reported World Radio, USA) * "If you are high enough the antenna will operate as well as the well-known 3-element beam with which we compared it. The tests were operational, not theoretical. We find that if we can hear them we can work them!" (CQ Mag, USA) * In QRP contest scored unbeaten 1M Miles per watt.**

JOYSTICK ANTENNA SYSTEMS

SYSTEM "A"	150 w.p.e.p. OR for the SWL	**£48.55**
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FRG7 Rx. (And all accessories) (Rx. only £310.00) **£240.80** (Ask for Pkg. R.1.)

FRG7000 Rx. (And all accessories) (Rx. only £371.60) **£409.00** (Ask for Pkg. R.2.)

YAESU PRODUCTS

Now available on a larger scale via us. As an INTRODUCTORY OFFER FOR LIMITED PERIOD ONLY – the following REDUCTIONS., incl. carr., VAT., deliv. Securicor our risk. SAVE ADDITIONAL £13.50 if you order a JOYSTICK "J" same time.

FT-901DM	£920.00	FT-207R	£194.25
FT-901D	£816.50	FT101S	£442.90
FT-901DE	£805.00	FT-7	£297.70
FT-101Z	£560.65	FT227R	£238.90
FT-101ZD	£644.75	FR-101D	£588.65
FT-107M	£740.00	FT-7B	£420.45
FT-107M	£837.55 (incl. Mem.)	FT-301	£577.45
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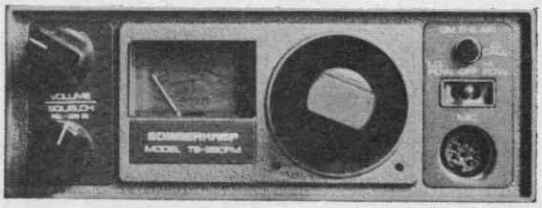
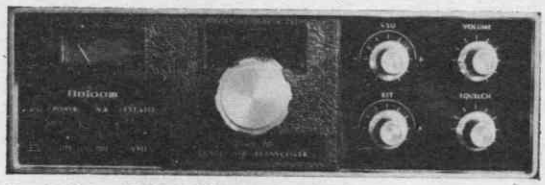
THE WORLD'S MOST COMPACT 2m 80 channel 50 watt TRANSCEIVER



Just stop and think what it will cost you to buy the average 2 metre synthesized rig to replace your crystalled job? Then look at the cost of a 50 Watt Burner? Doesn't it make sense to grab one of our **TS280FM's at £203.55 all in!** And you can have a telephone handset for privacy in the car, or a selective tone mic. etc etc. And it's a rather nice shade of blue!

SPECIAL OFFER: get together with your club mates and buy 3 for **£595** delivered.

"LINER 10" FIRST EVER 28MHz SSB MOBILE is now freely available from stock to class "A" licensees. It's about the size of a 2 metre box and has excellent performance.



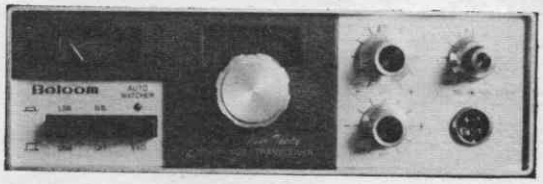
Both Liner 10 & 15 (21MHz version) at £167.90

LS707—Belcoms excellent 70cm all-mode now from stock at new low price **£495.00** includes VAT **and** carriage. Matching R707 Power supply also from stock at **£60**—all in.

SOMMERKAMP FT7B just arrived—your very best buy for this excellent HF set—**£415.**

TS802 SOMMERKAMP brand new 80 channel 2 Watt 2 metre handheld with built-in toneburst and repeater shift plus DIGITAL CHANNEL READOUT. Optional telephone handset for privacy on the bus! Robust aluminium case—**£172.50.**

FRG-7 ANALOGUE READOUT SOMMERKAMP £209.00 inc VAT.



LINER 430 70cm SSB MOBILES STILL EX-STOCK—£212.75 including VAT & delivery.

FT101ZD. If you are thinking about one of these excellent HF rigs think about FT277ZD SOMMERKAMP at **£661**—the price includes VAT/carr, and you get the CW filter and cooling fan **at no extra.** Discount if you collect.

LITERATURE: Please send a SAE for a quick reply with our literature, price lists. If you want one of the 1980 Sommerkamp colour brochures please ask. We will buy or trade your clean secondhand gear at good prices. Open 6 days per week.

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Datong RF Speech Clippers add "punch" to your speech signal and help you get through where otherwise you wouldn't. Their low-distortion **R.F. clipping** technique helps in two ways.

Model A.S.P.

NEW

Firstly it allows your transmitter to radiate more useful average power and **secondly** it improves the intelligibility of your speech in difficult conditions.

The renowned fully automatic R.F. clipper **MODEL ASP** is now joined by a new manually operated R.F. clipper **MODEL D75.** This supersedes our original manually controlled unit, MODEL RFC, and offers the following additional features:

Model D75

- Input monitor LED – lights when clipping is betwen 0 and 20 dbs.
- Power-on LED
- Low/High input impedance selector
- Stylish appearance to blend with any rig

Remember: all Datong R.F. clippers connect in series with your microphone. No internal connections are required. For R.F. clipping at minimal cost our MODEL RFC/M is still available. MODEL RFC/M is a fully assembled and tested R.F. clipper in PCB module form. You provide controls, case and power source.

Data sheets on all three R.F. clippers, including the new MODEL D75, are available on request. Price: Model D.75 £49.00 plus Vat (£56.35 total). Model A.S.P. £69.00 plus VAT (£79.35 total).

MORSE TUTOR

Morse Tutor has a calibrated speed control **plus**, and this is vital, a separately adjustable delay between letters.

Start at, for example, 12 words per minute but with a two second delay and just reduce the delay as you improve. It delivers five character groups of letters, numbers, or both together. The sequence is random so the supply is unlimited!

All this plus portability, built-in loudspeaker, personal earpiece and key jack. Only £43.00 plus VAT (15%), inclusive price £49.45. Full data sheet free on request.

MODEL UC/1 UP CONVERTER

If you already own a good quality ten-metre or two-metre receiver or transceiver you are only £118 away from a really high performance general coverage receiver. Just add the magic ingredient, MODEL UC/1 from DATONG!

You get full coverage in thirty synthesised 1 MHz segments from 60kHz (Rugby MSF) to 30MHz, at high sensitivity and with all the facilities and high performance of your existing rig!

For good measure UC/1 also adds two-metre coverage to ten-metre receivers. Price: £119.00 plus VAT (£136.85 total).

MODEL FL1

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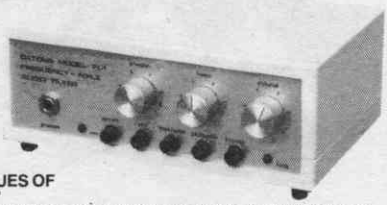
Agile

Audio

Filter

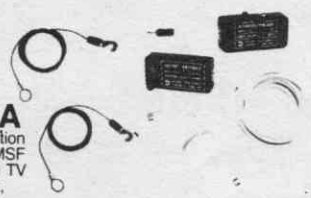


AS REVIEWED IN AUGUST ISSUES OF "QST" and "73"

A versatile add-on unit for communications receivers which helps to extract wanted signals from background interference. It connects in series with the loudspeaker or headphones. The effect is similar to "I.F. pass-band tuning" for SBB/ or RTTY reception, and bandwidth down to 20Hz (with limited a.f.c.) gives an amazing capability for pulling weak CW stations out of the QRM. Model FL1 is unique in being able to tune itself when notching out unwanted whistles.

Price: £59.00 plus VAT (£67.85 total).

MODEL AD170 ACTIVE ANTENNA



For sensitive reception right through from MSF at 60 kHz to Band 1 TV DX around 50 MHz, without the need for an antennae farm, MODEL AD170 has no adjustments and needs no external tuning units.

Although only three metres long, MODEL AD170 has the same directional properties as a full size dipole, even at 60 kHz.

Price: £33.00 plus VAT (£37.95 total); Special price complete with mains power unit: £37.00 plus VAT (£42.55 total).

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If you wonder how our products blend into a station, October's Rad. Com. gives some nice examples; out of the 7 photographs of members shacks, 4 show Datong equipment in use – (three FL1's, two RFC's and a UC1)

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TS120S	80–10m mobile transceiver	£495.00
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TR7600	2m FM mobile 10W transceiver PLL with 80 FM channels	£247.25
TR2300	2m FM portable transceiver PLL with all 80 FM channels	£199.00
TS180S	160–10m solid state transceiver	£712.00
TR7625	2m mobile/fixed transceiver	£273.00
	Spare power lead	£1.30
TR8300	70cm FM mobile 10W transceiver fitted 4 channels	£250.00
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HS4	Communications headphones	£10.75
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VHF MOBILE WHIPS

REVCO — PANORAMA — ASCOT — available

ROTATORS

AR40	(5 core cable required)	£54.63
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DR7600P	With preset or manual controller	£204.70

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All "J" Beam products available.

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DR7500	Will take 3 element tribander	108.10
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144.4 (433.2)	b	e	b	e	e	b	e	e	e	e	e	e	e	e
144.480	e	e	e	e	e	e	e	e	e	e	e	e	e	e
144.800	c	e	e	e	e	c	c	c	e	c	c	e	e	e
144.850	e	e	e	e	e	e	e	e	e	e	e	e	e	e
145.000/R0T	a	b	a	c	c	a	b	b	c	a	a	c	b	e
145.025/R1T	a	b	a	e	e	a	e	b	e	e	e	e	e	e
145.050/R2T	a	b	a	e	e	a	e	b	e	e	e	e	e	e
145.075/R3T	a	b	a	e	e	a	e	b	e	e	e	e	e	e
145.100/R4T	a	b	a	e	e	a	e	b	e	e	e	e	e	e
145.125/R5T	a	b	a	e	e	a	e	b	e	e	e	e	e	e
145.150/R6T	a	b	a	e	e	a	e	b	e	e	e	e	e	e
145.175/R7T	a	b	a	e	e	a	e	b	e	e	e	e	e	e
145.200/R8T	a	b	a	e	e	a	b	b	e	a	a	e	b	e
145.300/S12	e	e	e	e	e	e	e	e	e	e	e	e	e	e
145.350/S14	e	e	c	e	e	c	c	c	e	c	c	e	e	e
145.400/S16	e	e	e	e	e	e	e	e	e	e	e	e	e	e
145.425/S17	e	e	e	e	e	e	e	e	e	e	e	e	e	e
145.450/S18	a	e	a	e	e	a	b	b	e	a	a	e	e	e
145.475/S19	a	e	a	e	e	a	b	b	e	a	a	e	e	e
145.500/S20	a	b	a	c	c	a	b	b	e	a	a	e	b	e
145.525/S21	a	b	a	c	c	a	b	b	e	a	a	e	b	e
145.550/S22	a	b	a	c	c	a	b	b	e	a	a	e	b	e
145.575/S23	a	b	a	c	c	a	b	b	e	a	a	e	b	e
145.600/R0R	a	b	a	c	c	a	b	b	e	a	a	e	b	e
145.625/R1R	e	e	e	e	e	e	e	e	e	a	a	e	b	e
145.650/R2R	e	e	e	c	e	e	e	b	e	e	a	a	e	b	e
145.675/R3R	e	e	e	e	c	e	e	b	e	e	a	a	e	b	e
145.700/R4R	e	e	e	c	c	e	e	b	e	e	a	a	e	b	e
145.725/R5R	e	e	e	e	c	e	e	b	e	e	a	a	e	b	e
145.750/R6R	e	e	e	c	c	e	e	b	e	e	a	a	e	b	e
145.775/R7R	e	e	e	e	c	c	e	b	e	e	a	a	e	b	e
145.800/R8R	a	b	a	c	c	a	e	b	a	e	a	a	e	c	e
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We can supply crystals for **YAESU** FT2F, FT2FB, FT2 Auto, FT224, most of the **ICOM** range and the **TRIO-KENWOOD** range. We can also supply from stock crystals for the **HEATHKIT** KW202 and HW17A.

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Holders – Low frequencies HC13/U or HC6/U dependent on frequency.
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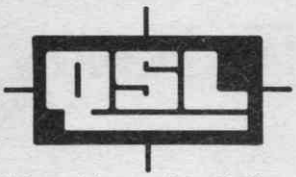

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R1	4.0284	8.0569	12.0854	14.9916	18.1281	44.9750
R2	4.0291	8.0583	12.0875	14.9944	18.1312	44.9833
R3	4.0298	8.0597	12.0895	14.9972	18.1343	44.9916
R4	4.0305	8.0611	12.0916	15.0000	18.1375	45.0000
R5	4.0312	8.0625	12.0937	15.0027	18.1406	45.0083
R6	4.0319	8.0638	12.0958	15.0055	18.1437	45.0166
R7	4.0326	8.0652	12.0979	15.0083	18.1468	45.0250
S8	–	–	12.1000	14.9444	18.1500	44.8333*
S9	–	–	12.1020	14.9472	18.1531	44.8416*
S10	–	–	12.1041	14.9500	18.1562	44.8500*
S11	–	–	12.1062	14.9527	18.1593	44.8583*
S12	–	–	12.1083	14.9555	18.1625	44.8666*
S13	–	–	12.1104	14.9583	18.1656	44.8750*
S14	–	–	12.1125	14.9611	18.1687	44.8833*
S15	–	–	12.1145	14.9638	18.1718	44.8916*
S16	–	–	12.1167	14.9667	18.1750	44.9000*
S17	–	–	12.1187	14.9694	18.1781	44.9083*
S18	–	–	12.1208	14.9722	18.1812	44.9166*
S19	–	–	12.1229	14.9750	18.1843	44.9250*
S20	4.0416	8.0833	12.1250	14.9777	18.1875	44.9333
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SR = Series Resonance *HC25 only

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	2	200 (total)	20 to 29.999 kHz	–	£16.50
	3	200 (total)	30 to 99.999 kHz	–	£10.50
	4	200 (total)	100 to 999.999 kHz	–	£6.00
	5	50	1.00 to 1.499 MHz	£9.00	£6.00
	6	10	1.50 to 1.999 MHz	£4.75	£4.20
	7	10	2.00 to 2.599 MHz	£4.75	£4.00
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	9	10	4.00 to 20.999 MHz	£4.55	£3.60
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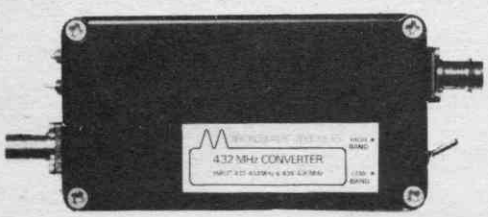

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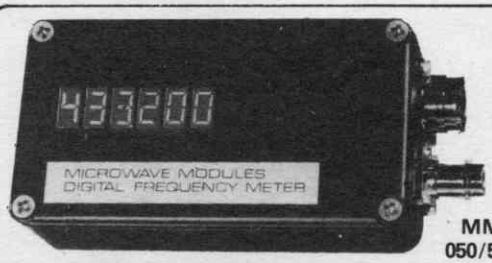

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3.5-4.0MHz SSB/CW RECEIVER

REVIEWED IN THIS ISSUE

RX80 MINIATURE SSB/CW 80M RECEIVER Module, host of features, very stable, USB/LSB, choice of filters, complete kit from **£34.50** (4kHz filter). **C16010** HF converter module. 160-10M + 1 extra band. Kit **£24.50** + crystals **£3.80** per band segment. **C28 SPECIAL OSCAR CONVERTER.** 29-30MHz. **£9.80** kit + 2 crystals. **ALSO 2 METRE FM 6 CHANNEL FM KITS—RX £25.00 TX** (1W + toneburst) **£21.50. SCANNER £8.30. PA £13.50.** All kits complete with drilled PCB, controls, wire, prewound inductors and instructions. Minimal test gear required. HF gear ideal SWL's or for second receiver. Full details 9 × 4in SAE. Mail Order only. P&P 50p per item. Also ready built.

A. L. Bailey G3WPO, 9 Alberta Walk, Worthing BN13 2SG

POPULAR QUALITY LINES IN PLUGS AND SOCKETS, ETC

All below inc VAT at 15%. Post 20p per parcel, any quantity

PL259 Plugs, excellent quality, **55p** ea (8 or more, **50p** ea); **Reducers** for above for UR43/76, **15p** each (8 or more, **14p** ea); **4 Pin Mike Plugs**, as used on most rigs, **60p** ea; **4 Pin Mike Sockets**, to fit above, chassis mt, **60p** ea; **2 × SO239 Coupler**, 2 sockets back to back, in line, **70p** ea; **2 × PL259 Coupler**, 2 plugs back to back, **70p** ea; **SO239 Socket**, square chassis mount, **55p** ea; **SO239 Socket**, single hole mount, **50p** ea; **SO239 to PL259 Elbow Coupler**, **£1.00** ea; **'T' Connector**, 3 × SO239 outlets, **£1.20** ea. *SAE full lists.*

W. H. WESTLAKE, CLAWTON, HOLSWORTHY, DEVON

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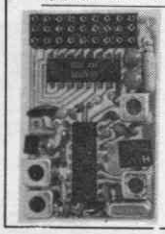
IT'S HAPPENNED* AGAIN !

THE PART THREE CATALOGUE IS PUBLISHED & WE HAVE MOVED TO BIGGER PREMISES.

Yes, it's here at last - the all new Part Three Catalogue. Fun for all the family, and the usual update on all that is new, worthwhile and exciting in the world of Radio and Communications. A big section on frequency synthesis techniques covering broadcast tuners, to communication quality transmitter systems. More new products than ever - RADIO CONTROL parts, crystal filters, ceramic filters for 455kHz and the new range of TOKO CFSH low temperature coefficient types for 10.7MHz. Details on new radio ICs, including the new HA11225, the CA3189E lookalike with 84dB signal to noise, and adjustable muting threshold. Radio control ICs - and an updated version of the RCM&E 8 channel FM receiver - now with an Ambit designed screened front end, with 27MHz ceramic bandpass filter. LCD panel clock/timer modules - the neatest and best LCD panel DVM yet (only £19.45 each + VAT), the new 5 decade resolution DFM3 for LW/HF/VHF with LCD readout. The DFM6 with fluorescent display to 10kHz resolution on VHF, 1kHz on SW. A 1kHz HF synthesiser with five ICs - the list is endless. Get your copy of the catalogue now. Post publication price is 60p (inc PP etc). The previous two sections are also required for a complete picture: Parts 1 & 2 £1 the pair. All 3 £1.50. And don't miss our spot the gibbon contest, together with a quiz to see if you can spot the differences between a neolithic cave drawing and a circuit diagram of one of our competitor's tuners.

(* Yes, we still haven't learnt how to spell.)

Updated RCME FM radio control RX kit



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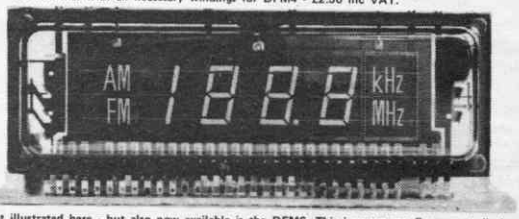
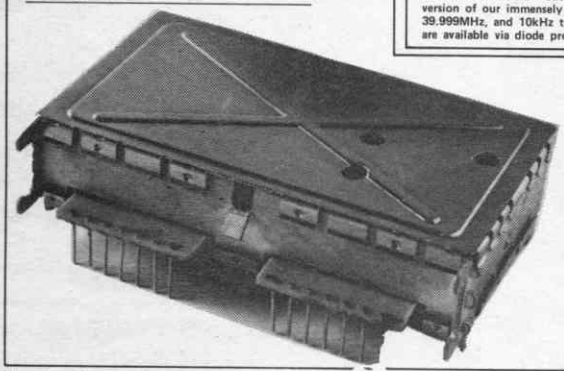


Not illustrated here - but also now available is the DFM6. This is a vacuum fluorescent display version of our immensely popular DFM3 (LCD). Resolution is 100Hz to 3.9999MHz, 1kHz to 39.999MHz, and 10kHz to 200.00MHz+; all standard IF offsets (inc. 10.7MHz on shortwave) are available via diode programming.

New series of radio modules in fully screened cans:



UM1181 VHF band 2 VARICAP TUNERHEAD
5 tuned circuit, with image/spurii better than –80dB, buffered LO output, MOSFET RF stage, FET IF preamp, tunes with only 1½ to 8v, –9dBm 3rd order intercept. 1off price £12.00 inc VAT. (100off/ OA)

911225 FM IF strip with all mod cons for the HiFi tuner:
All types use 80+dB S/N Hitachi IC, with muting, AFC, AGC, meter outputs for signal level and centre zero. IF preamp stage.
'A' Dual linear phase ceramic filters, with MOSFET (AGC'd) IF preamp and a 3rd narrow filter with DC filter selection. Dual tuned FM detector stage. £23.95 inc VAT (built)
'B' Dual ceramic filters, single tuned detector stage £14.95 inc VAT
(All 'A' series units are set up with a spectrum analyzer for best THD)

91072 AM RADIO TUNER MODULES - DC TUNED and DC SWITCHED Available February '80
All include buffered LO output, mechanical IF filter (TOKO CFMQ) 1-10v tuning bias, switching by a single pole to earth
A MW/LW (150 to 350kHz LW range) with ferrite rod antenna
B As 'A' but also including SW1 or SW2 (specify.)
SW1 = 1.8 to 4MHz SW2 = 5 to 10MHz
C With both SW ranges
Prices -one off INC VAT
'A' £14.43 'B' £15.90 'C' £17.50 (Custom types OA)

There is a danger - when advertizing in some magazines - that because we do not find space to list everything we sell in every ad., that some readers forget about half the ranges we stock. So to summarize the general ranges:

TOKO	Chokes, coils for AM/FM/SW/ MPX, Audio filters etc Filters: Ceramic for AM/FM, LC for FM, MPX etc. Polyvaricons ICs for radio, clock LSI, radio control, MPX decoders etc
Micrometals	Dust iron cores for toroids for resonant and EMI filters Toroid mounts
Hitachi	Radio/audio/mpx linear ICs 100W MOSFETs, small signal FETs, MOSFETs and bipolar

And the following groups of products from a broad range of sources:

Semiconductors –specializing in radio devices, Plessey SL1600, EUROPE's best selection of AM/FM and communications devices. Power MOSFETs, WORLD's LOWEST NOISE AUDIO small signal transistors, BAR graph LED drivers for linear and log.
CD4000 series CMOS, TTL/LPSNTTL, standard linears (741, 301, 3080 etc). MPUs, memories. Small signal transistors from AEG BC237/8/9 families etc. (1000 off BC239C : 5.2p ea)
LEDs: AEG 3mm/5mm round, 2.5x5mm flat, red, greem, orange, yellow. The best prices you will find for quality products.
MOSFETs for RF signal processing, including the BF960 UHF device, and 3SK51 for VHF.
Varicap diodes for 17:1 capacity ratio tuning

FREQUENCY READOUT LSI from OKI, with a one-chip answer to most digital frequency display needs (and various modules).
Crystal and ceramic ladder filters from leading manufacturers, ferrite rods, various ferrite beads and a range of crystals for 'standard' frequencies and both AM and FM radio control at 27MHz.
Trimmer capacitors.
METERS - a new range of linear movement types, plus many 'indicator' types for VU, all types of tuning indicators etc.
SOCKETS - a new range that are better quality than Texas low profile, yet better priced.
Modules for AM/FM/STEREO, complete kits for tuners, audio amplifiers from Larsholt.
SWITCHES - complete low cost DIY systems for push button arrays, keyboard switches.
DOUBLE BALANCED MIXERS - MCL SBL1, replacement for MD108 etc. And cheaper.

OUR LATEST MOVING EXPERIENCE :: At last, we have moved to the address below. There is car parking for customers approaching via North Service Road (an extension of North Road Avenue, entrance opposite the Brentwood Fire Station.) Pedestrian access from the High Street (alongside 117 High Street). The new building is six times bigger than our Gresham Road offices, and we will be installing a much expanded sales counter in the fullness of time. NEW TELEPHONE NUMBER (0277) 230909, TELEX NUMBER (as before) 995194 AMBIT G. See you there !

200 North Service Road, Brentwood, Essex.

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Apple II—Tandy TRS80—Pet's—ITT2020—Sorcerer.

Apple II/ITT2020: Software packages + Documentation for sending and receiving Slow Scan TV (**£18.00**) and Communications (Morse, RTTY and ASCII) (**£15**). Slow Scan does not require any external hardware, just uses cassette port. Communications requires simple interface details included.

PET—TRS80—Sorcerer: Marcotronics Software/Interface packages with documentation. Available for Pet 8, 16, 32K, TRS80 Level II 16K RAM, Socercer 16K RAM. Buy an Apple II from us and we give you the Slow Scan TV and Communications programs free.

Amateur Radio Software: Apple II/ITT/PET: Locator: Great Circle: Code: Eurocator on cassette or disk prices between **£3.50** to **£8.00**.

For Apple II Disk users VHF Contest Logging/Scoring system—requires Applesoft, 32K & Single Disk—Logs up to 2000 contacts, checks for duplicate contact on logging—prints out contest log, works out ITU & RSGB scores, totals up scores and finds furthest contact on log. Supplied on disk with documentation. **£35.00.**

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Official West Country dealer for Apple II Computer and range of accessories.

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GAREX (G3ZVI)

VHF RECEIVERS SR-9 MkII for 2-metres FM with 144-146MHz full coverage VFO, also 11 xtal controlled channels, ideal for fixed, /P and /M use. Built-in LS, 12V DC operation, **£47.15.** Xtals **£2.60** each.
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MAINS PSU for above, 13·8V regulated **£11.95.**
HF12 POCKET VHF FM RECEIVER 12ch xtal controlled. 4MHz bandwidth in range 140-175MHz. With nicad and charger, **£57.95.** Amateur and marine xtals in stock, prices as SR-9. Wide range available.
AMPLIFIER MODULE new fully assembled 6W IC unit 12V dc low imped. (4-8Ω) in and out for extn speaker amplification. With cct. **£2.75.**
Integrated circuits: 723 (TO5), **75p;** SN76660, **75p;** CD4001AE, **25p;** NE555, **55p;** 709 (TO5), **30p;** 741 (DIL 8), **30p;** 7410, **25p;** 7472, **25p.**
Resistor Kits. E12 series, 22Ω to 1M, 57 values, 5% carbon film, ¼W or ¼W (please state). **Replenishments available.** Ratings at 70°C. Starter pack, 5 ea value (285) **£3.10.** Standard pack, 10 ea (570) **£5.55.** Mixed pack, 5 ea ¼W + ¼W (570) **£5.55.** Giant pack, 25 ea (1425) **£13.60.**
PL259 UHF Plugs + reducer **75p** each, 5+: **67p.**
SO239 UHF Socket panel mtg **60p** each, 5+: **50p.**
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Connects straight into transceiver lead and the r.f. switch changes over automatically between transmit and receive—any mode. See above for spec. 12V nominal, size 2½" × 1½" × 4". **£17.83*** Ex stock. 70cms version **£20.90*** Ex stock.

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*Prices include VAT at 15%. *Belling Lee sockets standard SO2395* **£1.73** *extra. Please ring or write for any information. 12 month guarantee. To order: C.W.O. or credit card. Phone your credit card number for same day service. BL plugs* **25p.** *PL259 and reducer* **75p.**

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Carbon Film, ¼W E24 series 1R to 3MO E12 series to 10MO **1p**
Metal Film ¼w, ½w & 1w E12 Series 1OR to 2M2..... **2p**

CAPACITORS
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2% 56pf to 330pf..... **4p** 10% 390pf to 4700pf..... **4p**

Plate Ceramics 50V working for vertical mounting
E12 Series 22pf to 1,000pf and E6 Series 1K5pf to 47Kpf, **2p**

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·01, ·015, ·022, ·033, ·047, ·068 **4p.** 0·1 **5p.** 0·15, 0·22 **6p**
0·33, 0·47 **8p.** 0·68 **11p.** 1·0 **15p.** 1·5 **20p.** 2·2 **22p**

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·47/50	5p	22/16	5½p	47/50	6p	150/16	7p	470/25	11p
1·0/50	5p	22/25	5½p	100/10	6p	220/16	8p	470/40	16p
2·2/50	5p	22/50	6p	100/16	7p	220/25	8p	1000/15	15p
4·7/50	5p	47/16	5½p	100/25	7p	220/50	10p	1000/25	18p
10/50	5p	47/25	5½p	100/50	8p	470/16	11p	1000/40	35p

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0·22/35	14p	2·2/35	15p	22/6	20p	22/25	35p	47/10	35p
0·47/35	14p	4·7/25	15p	15/25	35p	47/6	30p	47/16	60p
1·0/35	14p	10/25	29p	15/25	35p	68/3	30p	33/10	30p

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10pf to 820pf **3p** 1kpf to 10kpf **4p** 12kpf **5p**

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TRIMMER CAPACITORS:

OXLEY AIRSPACED 1–15pf, 2–30pf, **25p each.**

FILM DIELECTRIC 10mm dia. 2–25pf **10p**, 4–60pf **18p.**
7mm dia. 1–10pf, 1–16pf, **12p** each.
7mm sq. 1–5pf, 1–10pf, 2–18pf, **15p** each.
PYE WESTMINSTER PA type 10–60pf, **20p.**

TETFER TRIMMER 1–10pf P.C. or chassis mounting, **28p.** each

CERAMIC 10mm dia. 2–8pf, 3–10p, 10–40pf, **15p** each.

CERAMIC COMPRESSION small type 10–40pf, 10–80pf, **10p** each.

MULLARD TUBULAR 0·8–7pf bolt in type, **25p.** each.

TUBULAR CERAMIC solder in type 1–6pf, **10p** each, **75p** per 10.

RESISTORS bag of approx 250 mixed vertical and horizontal mounting pre-formed types all with long leads. These are ¼ watt carbon film resistors ideal for the constructor and experimenter, a good range of values supplied ONLY **£1.50** per bag. If you're a manufacturer then we may be able to fix you up with certain values at the right price.

DISC CERAMIC CAPACITORS bag of mixed values from 1pf to 220pf, 18 different values max. size 6mm dia. all with std length leads and made by ERIE again ideal for the constructor especially if you are a VHF man. **£1.25** per bag of approx 100.

ELECTROLYTIC CAPACITORS bag of 100 mixed axial lead types values 2MF to 1000MF, ONLY **£1.50.**

FEEDTHROUGH GLASS INSULATORS silver plated requires 3½mm hole and solder in, **60p** per 100.

FEEDTHROUGH CAPACITORS 1,000pf 500v solder in type 3½mm hole, **25p** per 10.

CO-AXIAL DISC CERAMICS 100pf ideal for UHF/SHF, bag of 20 ONLY **25p.**

BNC SOCKETS single hole fixing 75 ohm, new in sealed packets, **45p.**

BNC RIGHT ANGLE ADAPTER 50 ohm, **75p.**

BNC BULKHEAD SOCKET 50 ohm, **60p.**

BNC LOW POWER DUMMY LOAD 75 ohm built into std. BNC plug, **25p.**

SO239 UHF CHASSIS SOCKETS 4 hole fixing, **55p.**

PL259 UHF plug for UR57 etc, **58p.**

HIGH VOLTAGE DISC CERAMICS 1,000pf 1·2Kv **5p** each. **40p** per 10. 0·01 MFD 2·5Kv **6p** each..

DISC CERAMICS 1,000pf 500vw, 2,200pf 500vw both types 6mm dia. **20p** per 10. 0·047mf 30vw 10mm dia. PC mount **15p** per 10.

THE GABLES, 20 BARBY LANE, HILLMORTON, RUGBY, WARWICKSHIRE CV22 5QJ

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